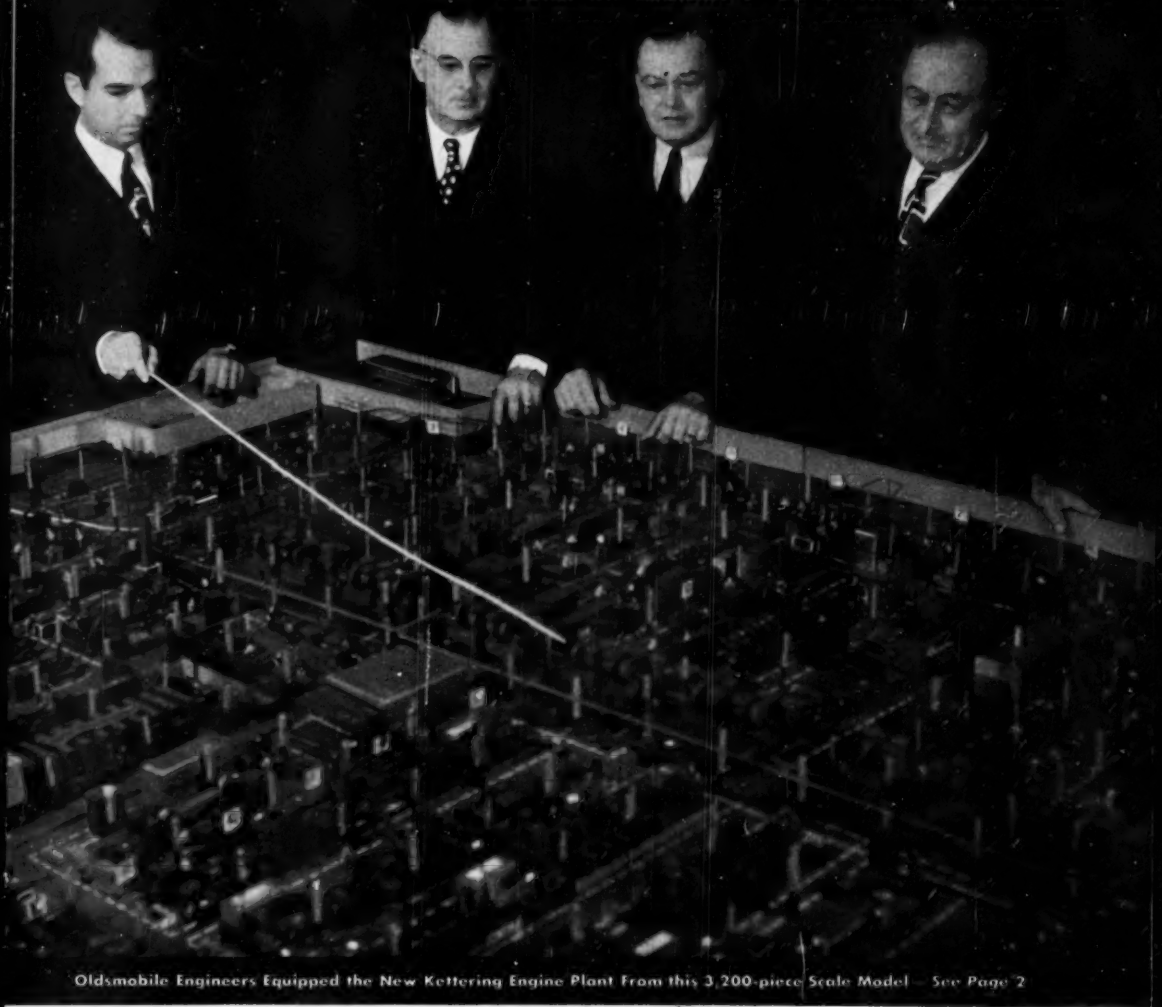
JANUARY 27, 1949

American Machinist

McGRAW-HILL MAGAZINE OF METALWORKING PRODUCTION



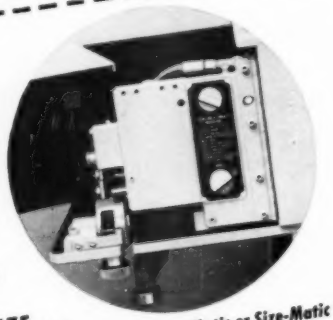
Oldsmobile Engineers Equipped the New Kettering Engine Plant From this 3,200-piece Scale Model — See Page 2

36TH ANNUAL REVIEW NUMBER

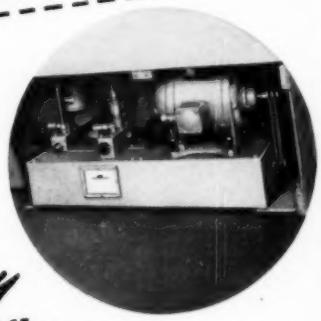
NEW HEALD
INTERNAL GRINDING MACHINES

Easy
TO SET UP . . .
quick, accurate dial feed settings

Easy
TO OPERATE . . .
convenient, centralized controls



Easy
TO HOLD SIZE . . .
automatic, uniform size control with Gage-Matic or Size-Matic sizing



Easy
TO SERVICE . . .
accessible, roll-out hydraulic unit

and . . *Easy on Costs!*

Every feature of the new Heald Internal Grinding Machines is designed to help you turn out better work—*easier, faster* and *at lower costs*. All together, they represent a major advance in precision grinding technique.

Besides the features shown, new Heald Internals provide uniform, preset feeds that remain constant regardless of temperature changes; isolated hydraulic unit preventing transmission of accuracy-destroying heat and vibration; improved cylinder and piston design; automatic lubrication; universal valve manifold; leak-proof flared steel tubing; permanently-lubricated cool-running wheelheads; more rigid workheads.

These new Heald Internals can give you a new conception of precision and low costs in internal grinding . . . and they're built in a complete range of sizes in Chucker and Centerless models to meet your requirements. We invite you to get complete information from your Heald Representative, or contact Worcester direct.

Heald Model 271
Gage-Matic

HEALD

THE HEALD MACHINE COMPANY, Worcester 6, Mass.

Branch Offices in Chicago • Cleveland • Dayton • Detroit • Indianapolis • Lansing • New York

American Machinist

MAGAZINE OF METALWORKING PRODUCTION

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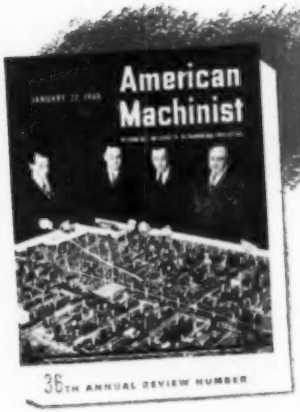


Chips and QUIPS

Our Cover . . . Taken especially for us, our cover Kodachrome shows J. J. Edwards, general methods engineer at Oldsmobile, pointing out equipment details to T. C. Downey, works manager; R. H. Barlow, plant engineer; and F. W. Haeger, general supervisor of Production Engineering. The model of the new engine plant at Lansing, Mich., is 8 x 12 ft., to a scale of ¼ in. per ft., and includes 3,200 pieces.

Methods Engineering worked out the model to select ideal locations for overhead conveyors, air conditioning equipment (164,000 cfm.), under-floor chip conveyors (3½ tons per hr.), stock slides, air and water lines, electrical conduits, fluorescent lighting fixtures, machines, stock and access aisles. All departments having to do with maintenance or operation of the new plant made their suggestions on the model, while the plant was still being planned.

The plant, with a capacity of 30 units per hr., is now producing the new Oldsmobile V-8 engine for 1949 models, operating on the high-compression principles developed by Chas. F. Kettering. All equipment in this 169,000-sq. ft. plant is new, including several transfer-type machines. One such unit, for milling, broaching and drilling the engine block, is 86 ft. long and has 18 blocks in process simultaneously. Other transfer machines have as many as 90 cutting tools at 17 stations.

Inspection holds parts to closer tolerances than ever before. Each cylinder bore, for example, is checked at four points and stamped with the proper classification for selective assembly. Diameter, roundness, taper and bell-mouth are all checked in one machine in seconds. Eight cylinder bore sizes are allowed, half the previous number.

This plant has 12,460 ft. of conveyor, of all types, bringing parts and subassemblies to workers at a uniform 38-in. height. More material is conveyed in this plant than in any other single area at Olds. Final assembly is 360 ft. long, flush with the floor, and the conveyor is of the indexing type. Engines go to 40 test stands, then to loading docks.

A special green color is used on all machinery to reduce eye strain.

1400 Items . . . This issue is your 36th annual catalog of Metalworking machines, equipment, parts and materials, containing this year some 1400 items. This is a trifle less than last year, because of the "bulge" created last year by the Machine Tool Show . . . As usual, we have tried to give you large, clear pictures and salient facts in captions, with items classified by subject for ready reference . . . Here's a desk handbook for all of 1949.

Statistics . . . This year we again provide our 16-page statistical summary of 1948 and Metalworking forecast for 1949 . . . Established two years ago, this special annual compilation has proved so popular we are continuing it, making the editorial content of this issue more than 50% over the norm.

Free Hat . . . Chester S. Ricker, our Detroit editor, joined the 20 other Detroit automotive writers a year ago in the AMA annual guessing game on automotive production. "Chet" guessed 4,100,000 passenger cars and 1,175,000 trucks, for a total of 5,275,000 vehicles. Final official estimate of the Automobile Manufacturers Assn. for 1948 is 3,911,000 cars and 1,371,000 trucks, for a total of 5,282,000 vehicles. So the AMA has given Chet a new hat, for the best job of "out-galloping Gallup." He'll wear it, except at the Indianapolis Race, where as official timekeeper he wears an orange beret . . . Chet hasn't told us his guess for 1949, but the average for the guessers is 5,460,000 vehicles, including 4,360,000 cars and 1,100,000 trucks.

Coming . . . Feb. 10 *A.M.* will bring you a special report on "How to Machine Beryllium Copper," a roundup on carbide dies and their production records, and a careful selection of outstanding methods at the new Oldsmobile engine plant shown on this issue's cover. Then, too, there's an explanation of how to bore with extreme accuracy in a lathe, a report on some recent milling tests, a description of some broadly useful air clamps and words of wisdom on work orders.

PRACTICAL IDEAS . . . the kind we can publish, go through the hands of Charles Emerson, assistant editor on the staff. "Chuck" graduated from Purdue University with his B.S.M.E. in 1947. It took him six years to make it, including a short stretch in the Army and some time out for working. He polished his engineering drawing by doing plant-layout drafting, and also labored as a production machinist at Harrison Radiator Div., G.M., in his home town, Lockport, N. Y. He tried the glue-manufacturing business, a chemical plant, and installing air conditioners during three summers, but decided that physical labor wasn't his idea of a good job.

At school, Chuck edited a dormitory newspaper and became managing editor of *The Purdue Engineer*. After six months as assistant make-up editor of *Popular Mechanics*, he joined *American Machinist* a year ago.

A UNIT OF GEAR CUTTING MACHINERY WITH A COMPLETELY NEW GENERATOR

FOR CUTTING SMALL

SPIRAL BEVEL,
ZEROL BEVEL,
HYPOID GEARS

The Gleason No. 2 Hypoid Generator . . . faster cutting . . . superior tooth bearing . . . production quantities or small jobs . . . closer control of actual cutting . . . heading a unit of equipment for the smooth production of bevel gears and hypoids for small tools and appliances.

GLEASON No. 2 HYPOID GENERATOR

GLEASON No. 7 HYPOID CUTTER SHARPENER

GLEASON No. 4 ANGULAR BEVEL TESTER

The Gleason No. 4 Angular Bevel Tester . . . employed to check the rolling qualities, tooth spacing and concentricity of the cut gears.

The Gleason No. 7 Hypoid Cutter Sharpener . . used for the sharpening of the multi-blade circular cutters used in the No. 2 Hypoid Generator.

GLEASON Works
1000 University Avenue
Rochester 3, N.Y., U.S.A.

Builders of Bevel Gear Machinery for Over Eighty Years

MILLING

Machines built by CINCINNATI MILLING

BROACHING

DO MORE WORK WITH LESS TIME OFF!

CINCINNATI

. . . take the knee types, for example: You have a choice of the correct power rating for your work, from 3 to 50 hp; Dial Types have power change of speed and feed; all horizontal styles have Dynapoise overarms for maximum cutability; all have principally automatic lubrication. Many other machine tools, silhouetted on this page, are built by Cincinnati Milling. And Cincinnati's reliable and efficient service organization

CUTTER GRINDING

is dedicated to keeping them running. Sweet's File for Mechanical Industries gives you a quick appraisal of the entire line. If you want more complete data, write for literature on machines in which you are interested.

MILLING MACHINES

KNEE TYPE—Nos. 2ML; 2MI; 2, 3, and 4 Dial Type (Medium and High Speed); 3, 4, 5 and 6 High Power Dial Type; 3, 4, 5 and 6 Dual Power Dial Type. (Most sizes built in Plain, Universal and Vertical Styles.)

PRODUCTION—18 sizes of Hydromatics, plain, duplex and tracer controlled. Plain automatics: 000-4, 0-8, 1-12, 1-18, 2-24. Duplex automatics: 2-24. Rise and Fall automatics: 0-8 and 2-24. Four Spindle 360° Profiler.

DIESINKING and GENERAL PURPOSE

—8" x 18" Tool and Die. Four Hydro-Tel types: 16" Vertical, 28" Vertical, 36" Vertical, 36" Horizontal.

BROACHING MACHINES

VERTICAL.....Seven sizes, single ram and duplex.

HORIZONTAL.....Six sizes, one-way and two-way.

CUTTER, TOOL, OPTICAL GRINDERS

CUTTER and TOOL—No. 2 Plain and Universal; Manaset; Contour.

OPTICAL—Projecto-form.

THE CINCINNATI MILLING MACHINE CO.

CINCINNATI 9, OHIO, U. S. A.

MILLING MACHINES • BROACHING MACHINES • CUTTER SHARPENING MACHINES
FLAME HARDENING MACHINES • OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

There's a CINCINNATI FILMATIC for grinding precision parts made by the *MILLION* or *ONE OF A KIND*

Precision cylindrical parts, custom-made or produced by the million, are being ground at minimum cost on CINCINNATI FILMATIC Grinders in shops throughout the world. In choosing Cincinnati, many advantages accrue·

They all have FILMATIC grinding wheel spindle bearings, an exclusive Cincinnati feature. Self-adjusting, they run for years without maintenance. Controls are conveniently located for easy operation. Automatic lubrication wherever possible. Automatic wheel balancing for the large center types. Reliable and efficient service organization, dedicated to keeping them running.

And CINCINNATI FILMATICS are built in many sizes and styles, silhouetted here, to precision grind the majority of work in most shops. Specific types of machines have many individual features which will pay off in your shop. Look in Sweet's File for Mechanical Industries, or write for literature on machines in which you are interested.

FILMATIC CENTERLESS GRINDING MACHINES

SIZE	Range, Diam.	Grinding Wheel Motor
No. 0	0-½"	2 hp
No. 2	1/16"-3½"	15 hp
No. 3	½"-6"	25 hp
No. 4	½"-6"	30 hp
No. 5	1"-7"	up to 50 hp
No. 6	1"-7"	up to 75 hp

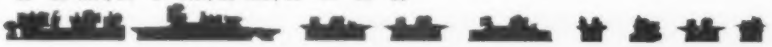
Centerless Lapping

FILMATIC CENTER TYPE GRINDING MACHINES

PLAIN — 4", 6", 10"-L, 10", 14"-L, 14" 16", 16" H.D., 20" 20" H.D., 24", 24" H.D., 28" H.D.

UNIVERSAL — 10", 12", 14", 16", 18" • **GAP** — 16"/40"

ROLL — 16" 20" 20" H.D., 24" 24" H.D., 28" H.D., 36" 44" 50" 60"



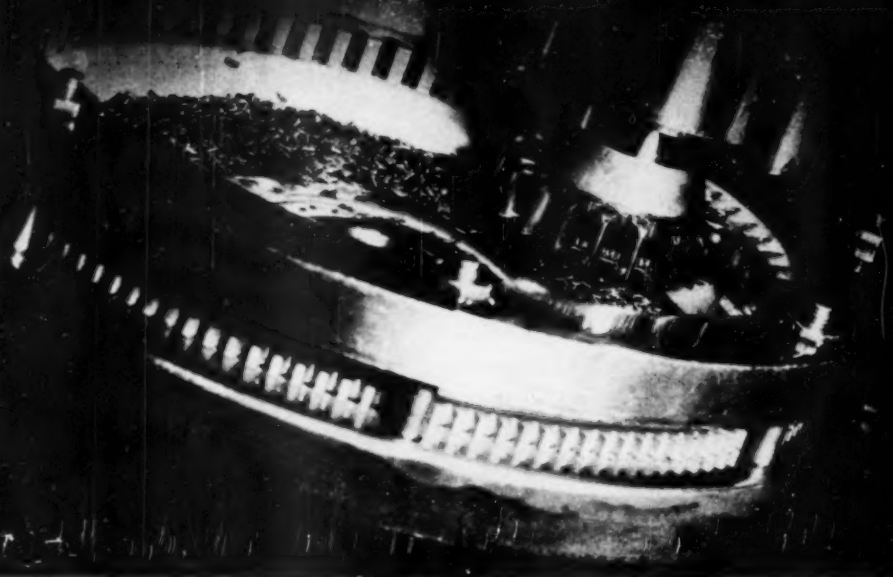
CINCINNATI

CINCINNATI GRINDERS INCORPORATED

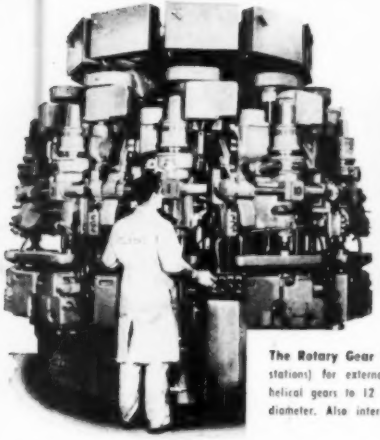
CINCINNATI 9, OHIO, U. S. A.

CENTER TYPE GRINDING MACHINES • CENTERLESS LAPPING MACHINES • CENTERLESS GRINDING MACHINES

GOOD GEARS

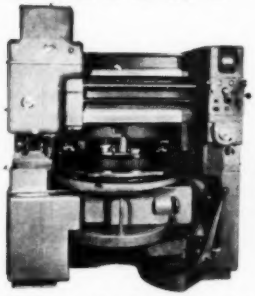


FELLOWS GEAR-



The Rotary Gear Shaper (10 stations) for external spur and helical gears to 12 inches pitch diameter. Also internals.

The Planetary Gear Shaper (6 work-spindles) for external spur and helical gears and pinions to 3½ inches pitch diameter.



The 36-inch Heavy-Duty Gear Shaper for intermediate and large size gears, and face widths up to 6 inches.

The 3-inch Fine Pitch Gear Shaper for small external and internal spur and helical gears. Often with magazine feed.

THE FELLOWS GEAR SHAPER COMPANY, Head Office & Export Dept., Springfield, Vermont.
Branch Offices: 616 Fisher Bldg., Detroit 2, Mich. • 640 West
Town Office Bldg., Chicago 12, Ill. • 7706 Empire State Bldg., New York 1, N. Y.

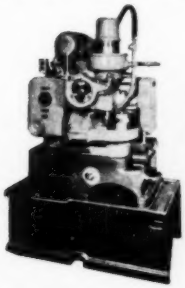
. . . . cheaper to produce

with FELLOWS' LATEST

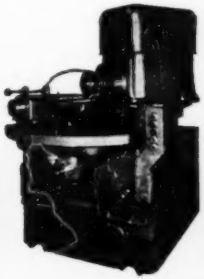
The late-model Fellows Machines offer the gear shop a major production advantage over older-type tooling. Increased stock-removal-capacity is offered in the large, medium and small machines, alike. Finer finish is achieved through still greater rigidity of work and tool relationship. Operating attendance costs come down with the rising importance of multiple-spindle machines.

Coordinated gear production operations may involve any combination of the machines and instruments shown below. Literature is available on all types. An inquiry addressed to the office nearest you will bring up-to-the-minute information of any kind, either general or specific.

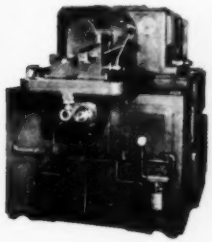
CUTTING ★ SHAVING ★ INSPECTION



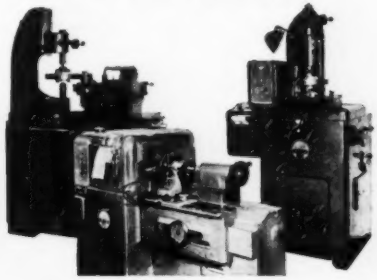
The 7-Type Gear Shapers for general service on external and internal spur and helical gears up to 7 inches.



The Full-Tool Shaving Machine for finishing external spur and helical gears up to 8 inches pitch diameter.



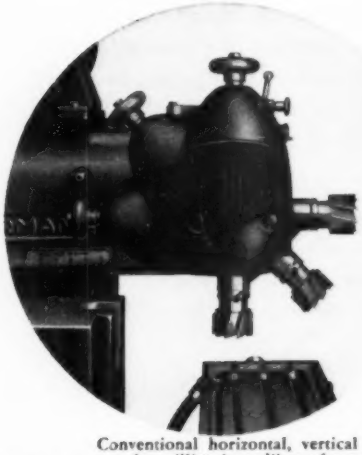
The No. 11 Gear Shaving Machine for finishing internal gears, both spur and helical, capacity dependent upon tool and fixtures.



The Inspection Instruments for (a) Involute measuring of tooth profiles (b) Lead measuring for the checking of lead, crown, and taper (c) "Red Liner" for inspection of errors in combination. All instruments are provided with automatic recording devices.

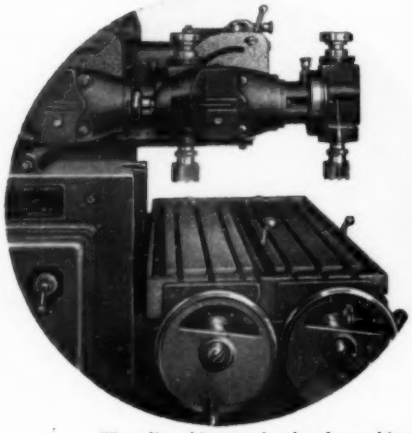
Fellows

Featuring...



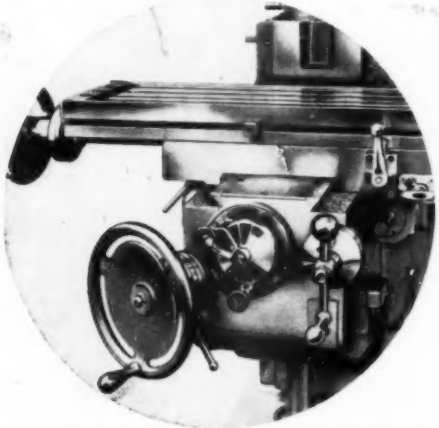
Adjustable Cutterhead

Conventional horizontal, vertical as well as angular milling is readily performed by simply positioning and locking the cutterhead in the desired position. This feature gives you the work range of several single purpose millers . . . reduces work set-ups.



Increased Range

The adjustable cutterhead and movable ram in combination with the saddle cross feed increase the work range and capacity of the machine. Permits a larger variety of work to be handled by this milling machine.



Conveniently Grouped Controls

All hand wheels and cranks for saddle cross feed and knee vertical feed as well as table longitudinal power feed are conveniently grouped in front of knee. Power feeds are easily selected with the quick change feed selector.

Single Lever Electrical Controls

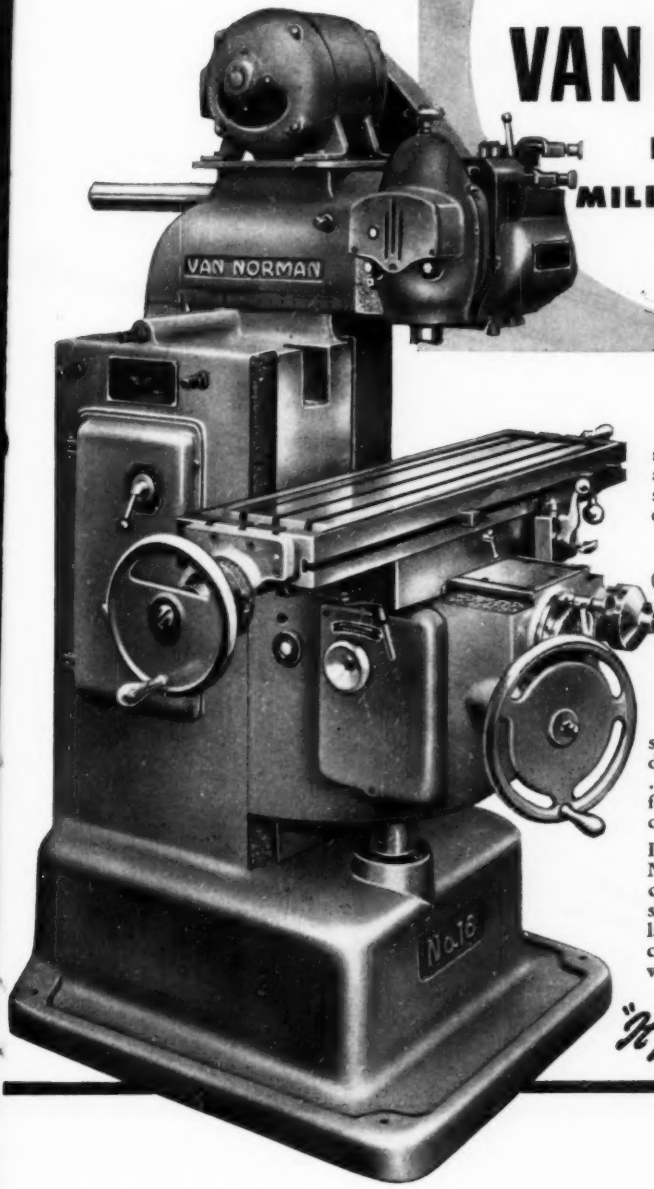
A single lever controls spindle, feed, and coolant. By merely positioning this lever the operator can start the spindle only, start spindle and coolant flowing . . . spindle and feed . . . or start spindle coolant and table longitudinal feed. The same lever reverses the operations.

VAN NORMAN COMPANY

SPRINGFIELD 7, MASSACHUSETTS

The New No. 16 VAN NORMAN

RAM TYPE MILLING MACHINE



This new versatile No. 16 miller incorporates many outstanding and exclusive features not found in a single purpose machine. The adjustable cutterhead permits conventional horizontal and vertical, as well as angular milling, on *one machine.* It saves time by permitting most jobs to be completed on one machine instead of being moved from one miller to another.

Other cost reducing features include spindle speeds up to 2000 rpm... single lever built-in controls "start" and "stop" spindle, coolant flow and table longitudinal feed... quick, easy ram adjustment ... exclusive Van Norman speed and feed selectors... one-shot metered lubrication ... hardened alloy steel gears.

It will pay you to investigate the new Van Norman No. 16 Ram Type Milling Machine for use in the tool room, pattern shop, die and mold shop, experimental laboratory. It will reduce over-all work completion time, cut costs and increase work output.

"It pays to Van Normanize"

Manufacturers

PURCHASE ORDER
JAMISON MANUFACTURING CO.
200 E. Elm Avenue
Mt. Washington 40, Ky.
Account no. H-2161
Date November 15, 1948
Shipping instructions
Ship to Jamison Manufacturing Co.
200 E. Elm Avenue
Mt. Washington 40, Ky.
Landis Machine Company
Waynesboro
Pennsylvania
3
NOTICE: This order is given and accepted subject to all conditions and requirements stated herein and printed on the reverse side hereof.
Plus all taxes as stated herein and all taxes hereafter imposed on the goods or services covered by this order. Seller shall not substitute without the purchase order # unless otherwise specified.
P. O. CONN. REQUIRED
P. O. No.
EXCISE TAX EXEMPT CERT
Verbal
Weekly Shipments Thereafter
STATE TAX EXEMPT CERT
LEAD TIME
ITEMS
QUANTITY
DESCRIPTION
DELIVERY SCHEDULE: First Delivery to Arrive at Destination
and to Equal
MAY
JUNE
JULY
AUG.
SEPT.
One - 1½ LANDMACO Double Head Threading Machine,
as shown in bulletin attached. Same as above mentioned two-station; arranged for motor drive as follows ---
Landis heads, each fitted with the following ---
chaser holders:
1 Set 5/8" x 1-1/2" N.C.
1 Set 3/4" to 1" N.F.
1 Set 3/16" to 1-1/2" N.F.
1 Set 1-1/8" to 1-1/2" N.F.
Machines to be complete with standard auxiliary equipment as listed in bulletin.
One - 5 H.P. - 440 volts - 3 phase - 60 cycle - type K - 55 degrees C. frame 254, A.C. constant speed 1200 R.P.M. General Electric Co., Std. T.E., F.C., B.B., Sq. cage induction motor.
JAMISON MANUFACTURING CO.
J. J. Maddox

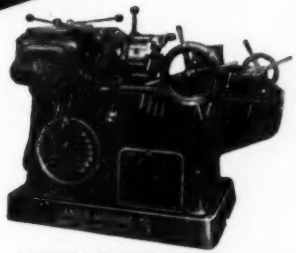
Thread cutting die heads and collapsible taps for threading machines, turret lathes, and automatic screw machines.

THE LANDIS CHASER

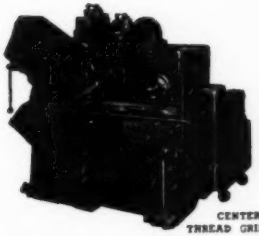
WORLD'S LARGEST EXCLUSIVE MANUFACTURER

Specify LANDIS

When Better Threads are Needed—

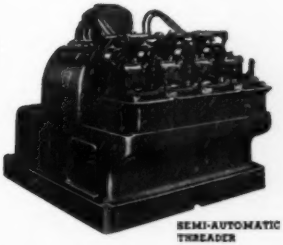


LANDMACO THREADING MACHINES

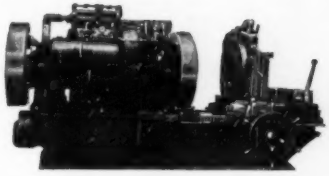


CENTERLESS THREAD GRINDER

AUTOMATIC NIPPLE MACHINE



SEMI-AUTOMATIC THREADER



PIPE THREADING & CUTTING-OFF MACHINES

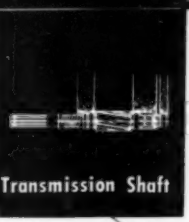
LANDIS Machine COMPANY
WAYNESBORO, PENNA.

OF THREAD GENERATING EQUIPMENT

Hypoid Gear

Differential Case

Universal Joint Spider



Transmission Shaft

Camshaft (contour)

Rear Axle

tall Bearing Race

17 Automotive Grinding Problems Solved with LANDIS TOOL Precision Grinders

- lower unit costs
- closer limits - fine finishes
- mass production

Illustrated above are some of the typical grinding problems in automotive production that have been solved with LANDIS TOOL precision grinders.

LANDIS TOOL *Precision Grinders*

Your grinding problem may be similar or entirely different. Our engineers will be glad to help you solve it. Recommendations will be made on the basis of your blueprints.

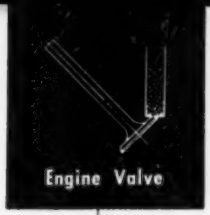
multiple wheel grinders

crankshaft grinders

centerless grinders

plain grinders

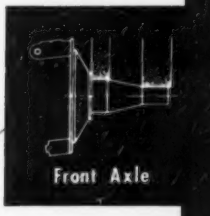
Camshaft (main bearings)

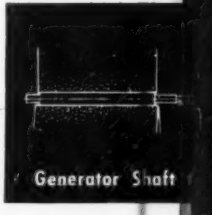

Engine Valve

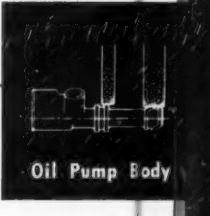
Hydraulic Valve Lifter Pistons

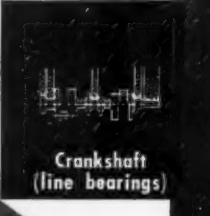
Piston

Distributor Cam

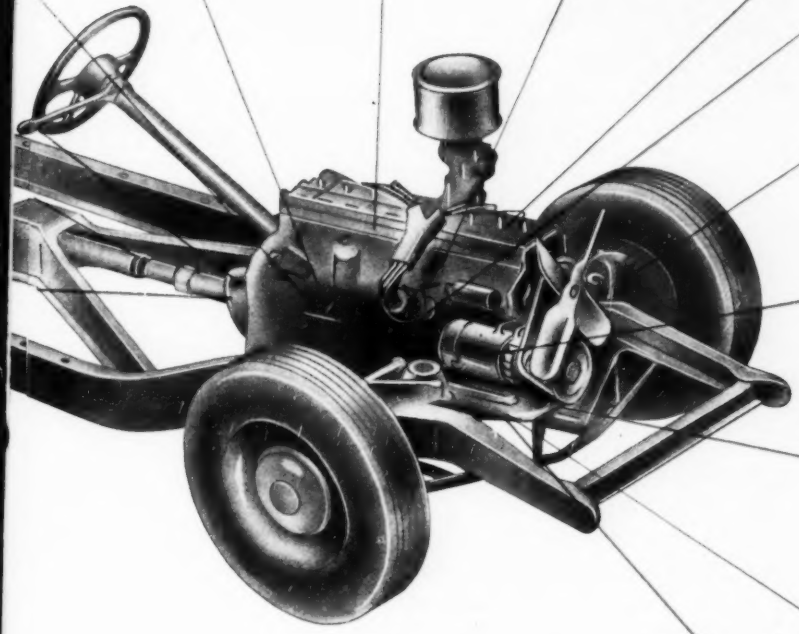

Front Axle


Generator Shaft


Oil Pump Body

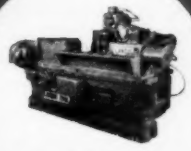

Crankshaft (line bearings)

Crankshaft (pins



LANDIS TOOL COMPANY, 12 EAST SIXTH STREET, WAYNESBORO, PENNA.

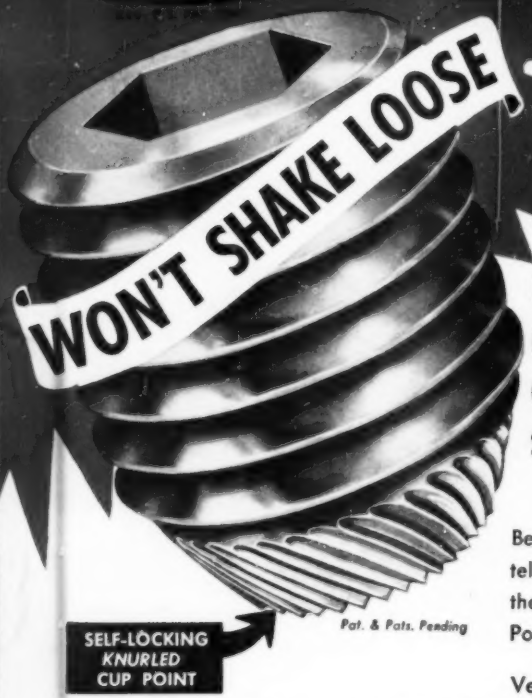
The most complete line of standard and special purpose precision cylindrical grinders available to automotive builders and suppliers.


camshaft grinders

valve grinders

ball bearing race grinders

UNBRAKO



Pat. & Pats. Pending

SELF-LOCKING *KNURLED* CUP POINT

... proved by

EXPLANATION OF VIBRATION TESTS DEMONSTRATING THE HOLDING POWERS OF DIFFERENT TYPES OF "UNBRAKO" SOCKET SET SCREWS

Better than words, the graph of actual vibration tests quickly tells the story of the exceptional "HOLDING POWER" of the "Unbrako" Self-Locking Set Screw with the Knurled Cup Point . . . *"the screw that won't shake loose."*

Vertically, the graph is divided into increments of 30 minutes. Each bar—black for Plain Cup Point and red for Knurled Cup Point—represents a screw tested and the number of minutes at which it loosened. *The height of each black bar, therefore, is a direct measure of the length of time before the plain pointed screw shook loose.* The Self-Locking Knurled Cup Pointed Screws—indicated by the red bars—were still tight at 300 minutes.

All screws were tested under identical conditions. Rate of vibration—1750 cycles per minute . . . duration of test—until screw shook loose or tests were discontinued.

Analyzing the graph and comparing the two types of screws, we find that the most favorable test of the Plain Cup Point shows a failure at 10 minutes and 40 seconds. *No Knurled Cup Point shows signs of loosening at 300 minutes—more than 28 times the "HOLDING POWER" of the Plain Cup Point—a tremendous superiority . . . as proven by actual tests and use.*

The "Unbrako" Self-Locking Set Screws with the Knurled Cup Point can be used over and over again.

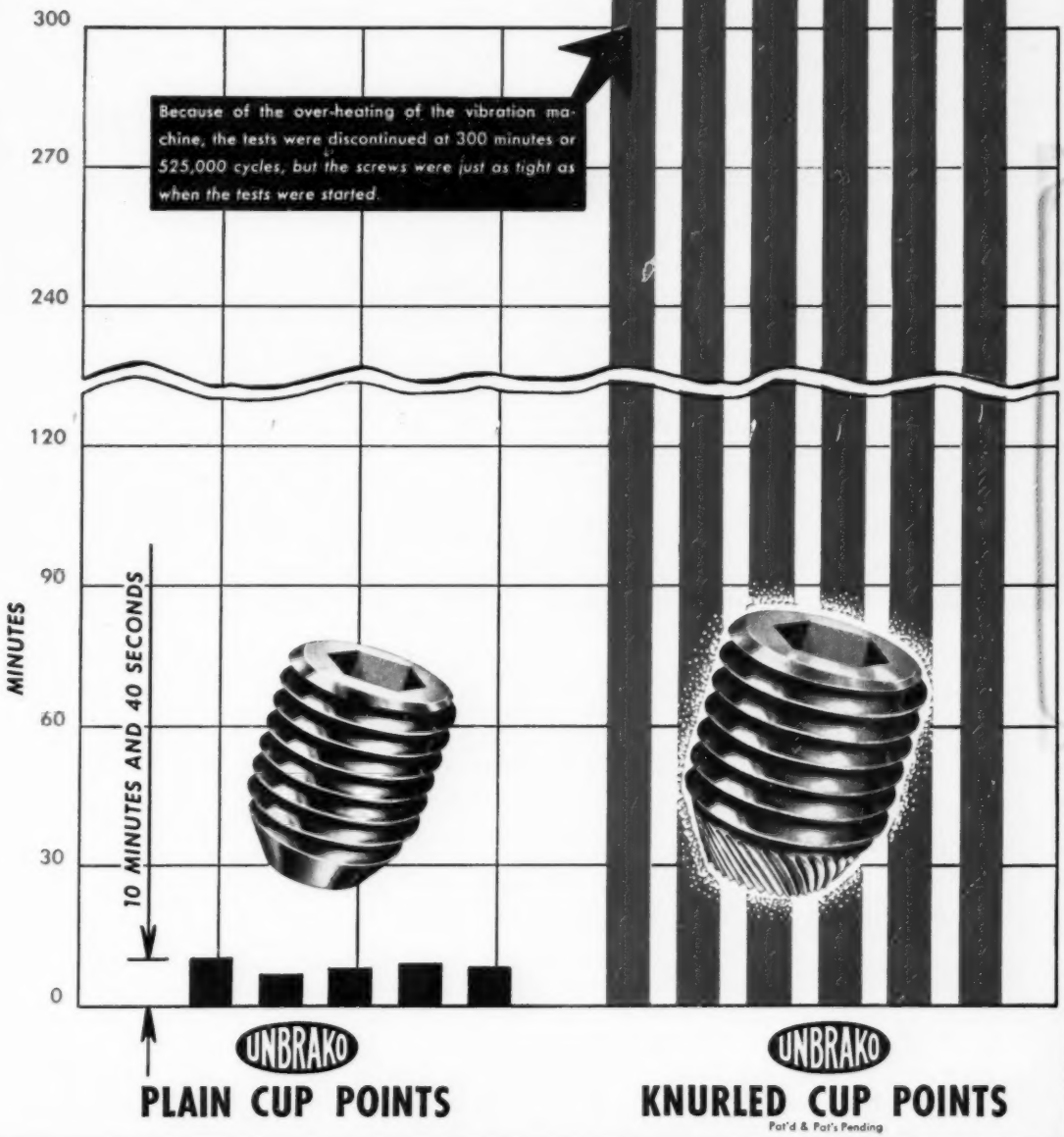
OVER 45 YEARS IN BUSINESS

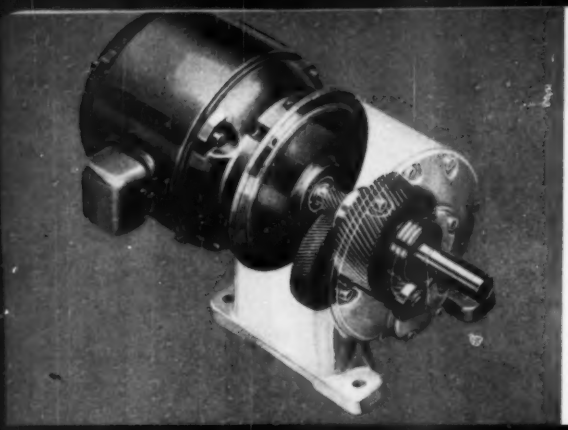
STANDARD PRESSED STEEL CO.

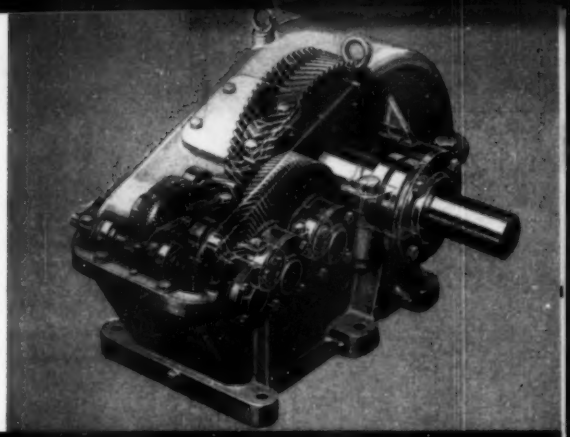
BOX 4, JENKINTOWN, PENNSYLVANIA

BRANCHES: CHICAGO DETROIT ST. LOUIS SAN FRANCISCO

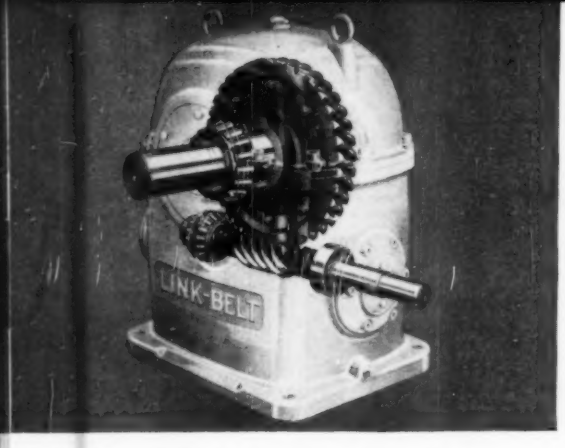
actual tests

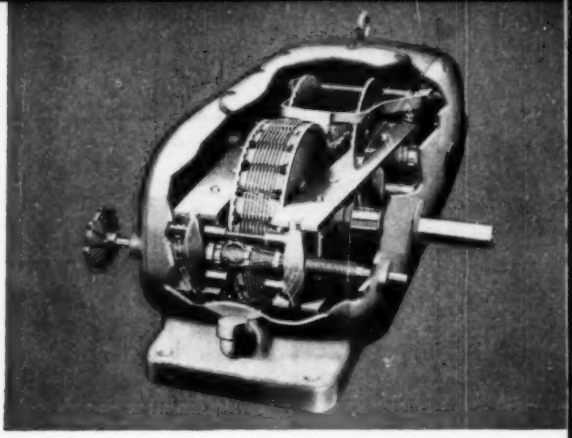






is Speed Reduction Your Problem?





Consult Link-Belt!

Power at the required speed is available through the use of a Link-Belt enclosed gear drive. Regardless of your specific needs for ratio, power or speed, we have the correct answer, and our engineers will be pleased to assist you with your power transmission problems.

Gearmotors

Packaged Power Drives that are compact, economical and highly efficient are available with ratings from 1 to 30 horsepower and output speeds from 280 to 6 R.P.M. These easily-installed streamlined Gearmotors are completely explained in Book No. 1815, a copy of which is yours for the asking.

PIV Gear Speed Changers

In any process where precise speed is a factor in quality, costs, efficiency or profits, the PIV Gear is the ideal answer to your problem. Built with vertical or horizontal housing, plain or motorized, and with or without enclosed reduction gears. From ½ to 25 h.p. and ratios up to 6:1. Send for Book No. 1874-B.

Worm Gear Drives

For high reduction drive arrangements, these time-proved rugged drives are an ideal answer. Take your choice from a complete line of single, double or helical Worm Gear Drives having horizontal or vertical output shafts and satisfy exactly your requirements. We would be pleased to send Book No. 1824, which describes in detail our Worm Gear Drives.

Herringbone Gear Drives

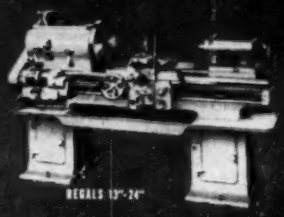
Link-Belt's large selection of single, double and triple reduction Herringbone Gear Drives adequately fill the bill for small, moderate or large horsepower speed reduction requirements. A mighty good answer to your speed reduction problem. Can we send Book No. 1819 so you can see for yourself?

LINK-BELT COMPANY Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8. Offices, Factory Branch Stores and Distributors in Principal Cities. 11,323

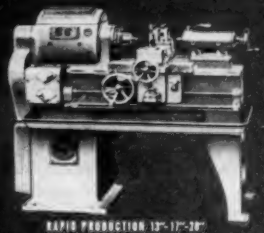
LINK-BELT

Power Transmission Machinery

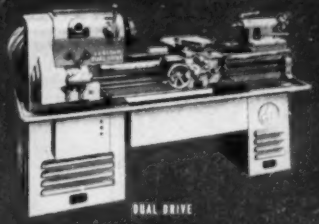
"THE COMPLETE LINE"



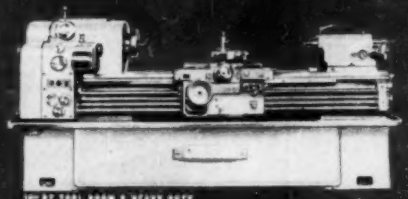
REGALS 13"-24"



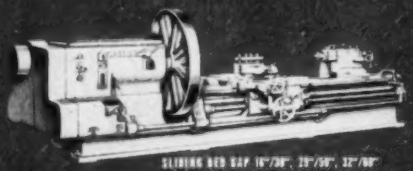
RAPID PRODUCTION 13"-17"-20"



DUAL DRIVE

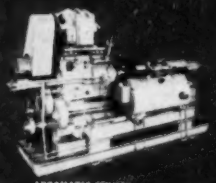


16" BT TOOL ROOM & HEAVY DUTY



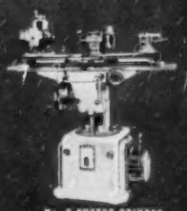
SLIDING BED GAP 16"/20", 25"/30", 32"/40"

More Lathes mean Greater Choice, Better Buy!



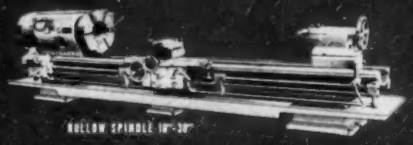
AUTOMATIC 12"-16"

HEAVY DUTY ENGINE 12"-32"

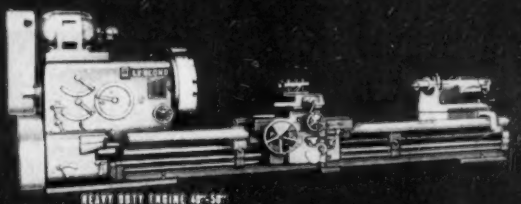


No. 2 CUTTER GRINDER

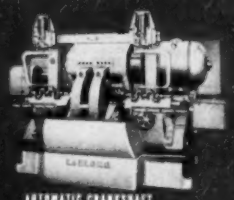
UNIVERSAL CRANKSHAFT 20"-30"



HOLLOW SPINDLE 10"-30"



HEAVY DUTY ENGINE 40"-50"



AUTOMATIC CRANKSHAFT

THE R. K. LeBLOND MACHINE TOOL CO., CINCINNATI 8, OHIO

LARGEST MANUFACTURER OF A COMPLETE LINE OF LATHES

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CHICAGO 6, Ill., 20 No. Wacker Drive, STAte 5561

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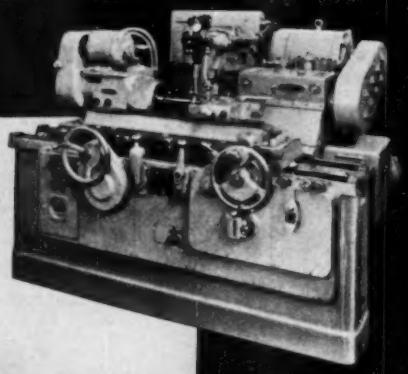
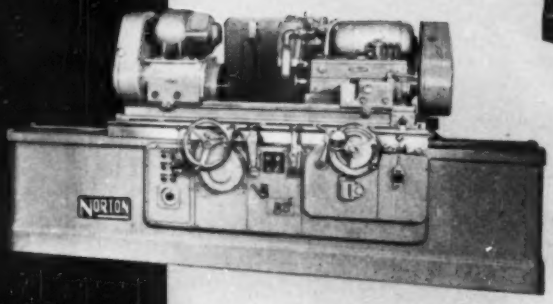
LeBLOND

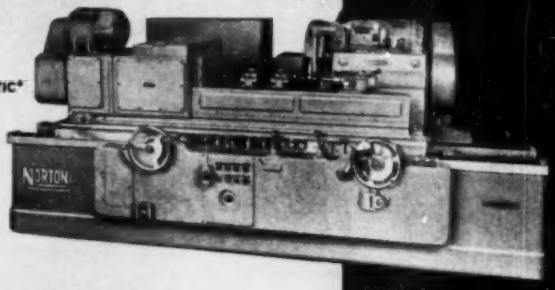
TEN *completely new . . . completely*



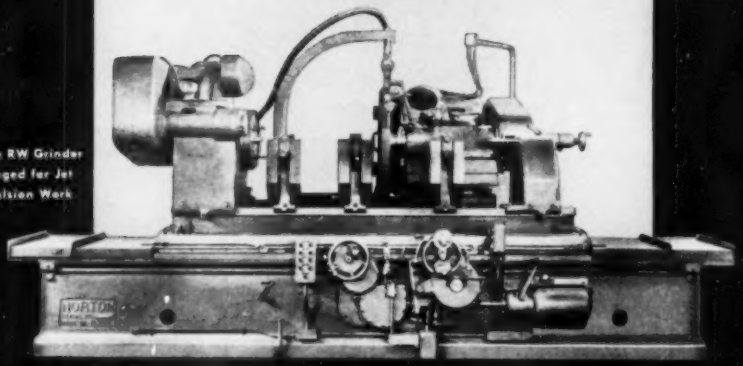
6" Type CTU
Cylindrical Grinder



10" Type CTU
Cylindrical Grinder



No. 2 CAM-O-MATIC*
Cam Grinder



42" Type RW Grinder
Arranged for Jet
Propulsion Work

Abrasives - Grinding Wheels - Grinding and Lapping Machines - Refractories - Porous Mediums - Non-slip Floors - Norbide Products - Labeling Machines

different NORTON MACHINES
to meet Today's *cost cutting requirements*

- These 10 new grinders and lappers are a further Norton contribution to "The World's Best Investment"—machine tools.
- Seldom are *so many* completely new and different machines offered at one time.
- All are expressly designed from up-to-the-minute knowledge of the things that make for *more production, easier operation* and *minimum maintenance.*
- Let a Norton representative show you where any one—or all—of these machines can *help you.*
- Catalogs on request—no obligation.

M-572

NORTON GRINDERS and LAPPERS

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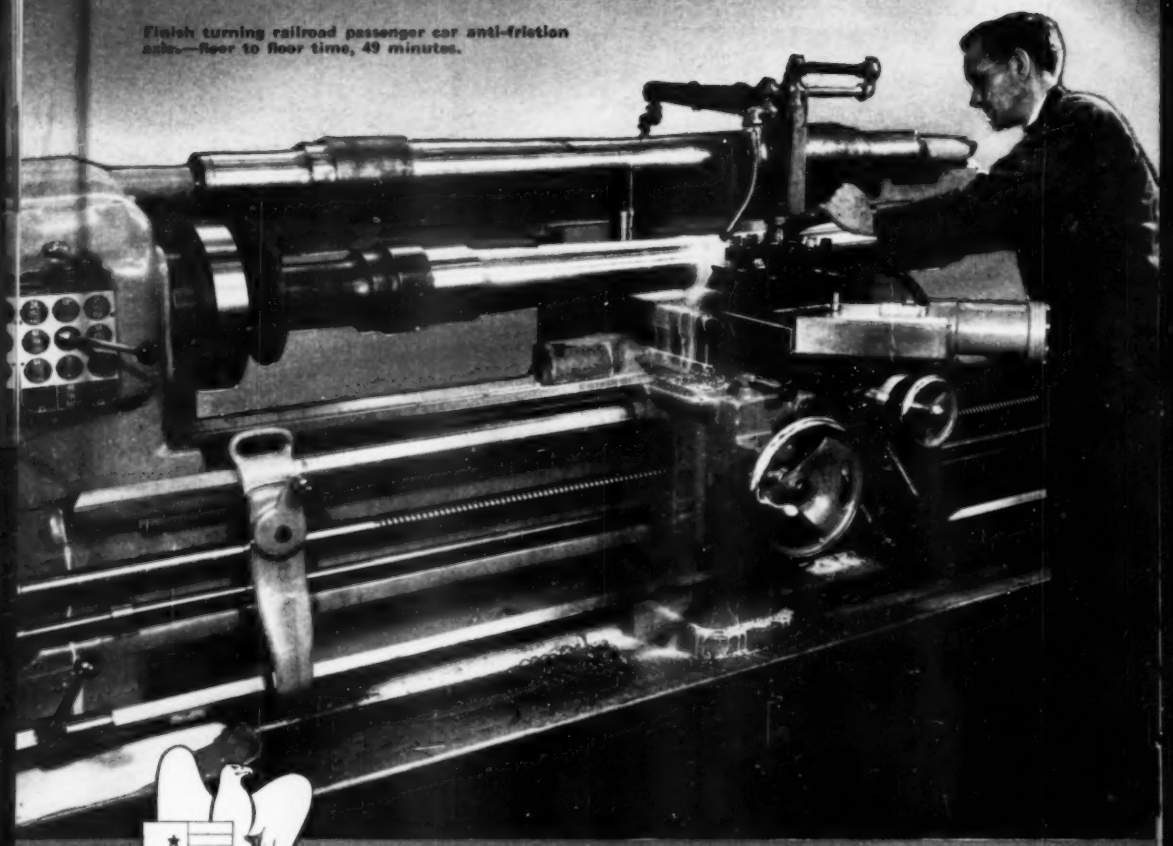
NORTON COMPANY, WORCESTER 6, MASS • New York • Chicago • Detroit • Cleveland • Hartford • Distributors in All Principal Cities

Production Costs hit a new low—

The "American" Hydraulic Shaft Duplicator introduces a new technique in shaft turning that has revolutionized the art. It is a thoroughly engineered development for reproducing work shapes from a template by means of a hydraulically controlled cutting tool. The template holder and tracer head are built-in at the rear of the lathe where they will not obstruct the operator's vision of the work or interfere with loading and unloading. All operating controls are located at the front of the lathe.

It is faithful and accurate in its reproduction.

Finish turning railroad passenger car anti-friction axles—floor to floor time, 49 minutes.



THE AMERICAN TOOL WORKS CO.

Rough and finish turning motor shafts 42½" long from 3¼" bar stock in floor to floor time of 39 minutes.

...THE LATEST *Cost Cutting* SENSATION!

Reductions of 75% are not uncommon.
Reductions of 50% are average.

It will reproduce steps, tapers, right angle and tapered shoulders, recesses, grinding necks and radii and is especially adapted to the production of such work as spindles, motor shafts, valve stems, back shafts, piston rods, axles . . . in fact any shaft having an irregular contour.

A single hydraulic system is employed for operating the hydraulic tracer valve and the piston which controls the movement of the tool slide carrying the cutting tool. This simplicity is an outstanding feature and insures accurate reproduction, freedom from failures and elimination of work rejects. This new metal cutting technique permits continuous cutting without interruption for measuring or calipering at feeds and speeds to the cutting limit of Cemented Carbide tools. "Miking" is confined to the first diameter only after which all other diameters are secured automatically.

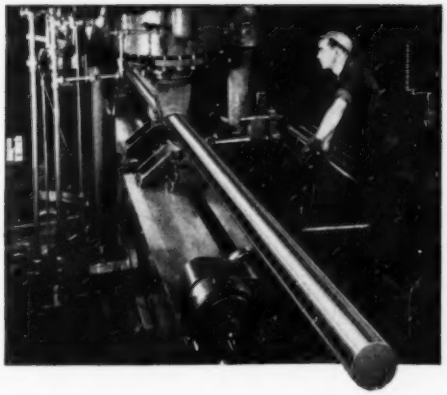
This machine may be quickly converted to standard lathe operations.

Descriptive Bulletin No. 35 sent upon request.

Cincinnati, Ohio U.S.A. LATHES AND RADIAL DRILLS

NO FINER STEEL BARS HAVE EVER BEEN MADE

than Union



Ground Rounds...

...Use them where Split-Hair Accuracy, Arrow-Like Straightness, Roundness and a Mirror Surface are Needed

Here are the finest commercial steel bars that money can buy—in sizes from ⅛" to 8", inclusive—just the bars you may need to improve product quality or to cut costs.

Union Ground Rounds are extremely accurate. The standard tolerance of Cold Drawn and Ground Rounds (Union Special Finish) in sizes ⅛" to 1⅞", inclusive, is plus .000", minus .002". That of Turned and Ground Rounds (Union Precision Shafting) is plus .000", minus .002" in sizes 1⅛" to 2 7/16", inclusive, and plus .000", minus .003" in sizes 2½" to 8", inclusive.

Since these tolerances always are *undersize*, Union Ground Rounds assemble readily—never require costly dressing down to fit.

Union Ground Rounds are uniformly straight and round, *too*—with a lustrous, smooth surface that minimizes friction and provides an attractive, bright finish.

With these fine steel bars you can assure:

1. **Perfect alignment of bearings, gears, cams, clutches and other moving parts;**
2. **Smooth, quiet, balanced operation in the most intricate mechanism;**
3. **Freedom from vibration at high speeds;**
4. **Reduced wear;**
5. **High Operating efficiency;**
6. **Longer service life;**
7. **Lower assembly, maintenance and per-year-of-service costs;**
8. **Attractive appearance.**

Union Cold Drawn and Ground Rounds provide the improved machinability and physical properties developed in cold drawing—while Union Turned and Ground Rounds may be machined unsymmetrically or threaded without warpage or distortion.

Both types can be produced in all standard and special carbon, alloy and stainless steel analyses. They can be furnished annealed, normalized, spheroidized, heat treated or strain relieved as required. Let us show you where Union Ground Rounds can benefit your product—and your costs.

REPUBLIC STEEL CORPORATION
Union Drawn Steel Division • Massillon, Ohio
GENERAL OFFICES • • • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, New York

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REPUBLIC STEEL — REG. U.S. PAT. OFF.

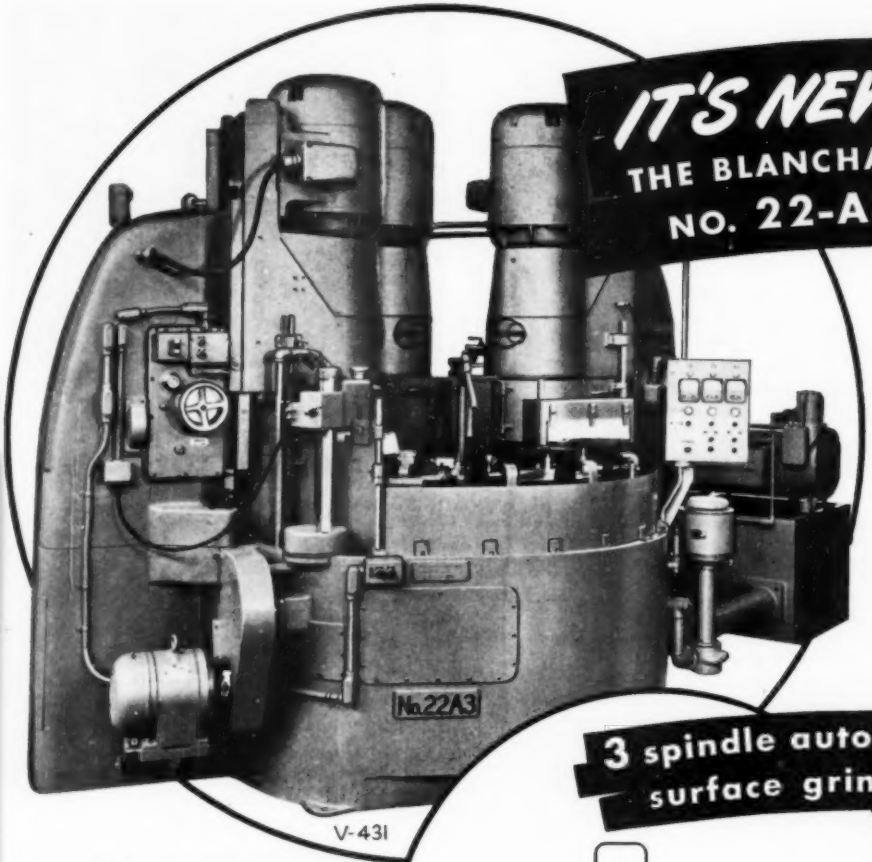
US

UNION COLD DRAWN STEELS

REG. U.S. PAT. OFF.

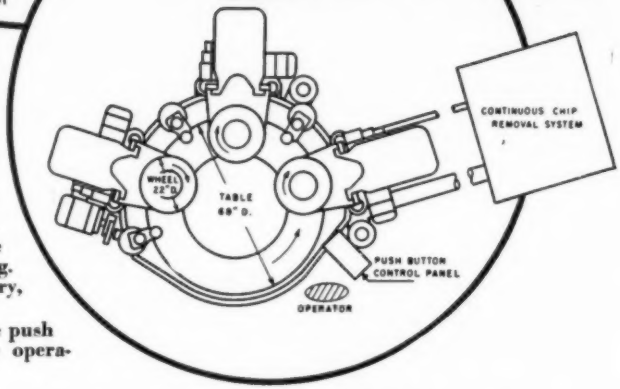
Free-Machining Bessemer, Alloy and Enduro Stainless Steels
•
Union Cold Drawn Special Sections
•
Union Cold Drawn and Ground Rounds; Turned and Polished Rounds; and Turned, Ground and Polished Rounds (Union Precision Shafting.)

IT'S NEW...
THE BLANCHARD NO. 22-A3



V-431

3 spindle automatic surface grinder



This new Blanchard 22-A3 Surface Grinder is a three spindle machine, completely new in design from the floor up. It permits the grinding of larger work—the removal of more metal—and produces a finer finish than is possible on the Blanchard 16-A series.

The Blanchard 22-A3 may be arranged so that two wheels do roughing and one wheel finishing, or one wheel roughing and two wheels finishing. If a relatively rough finish is satisfactory, all three wheels can take heavy cuts.

For ease of operation complete push button controls are located on the operator's panel.

For complete information on this or Blanchard 1, 2, 4 or 5 Spindle Machines in the new 22-A series with abrasive wheels 22" diameter, rotary tables 68" diameter and larger, write us today. New free catalog will be sent on request.

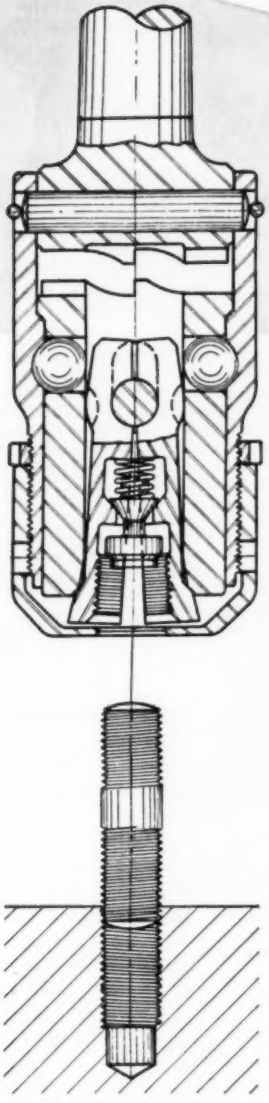
BLANCHARD

The **BLANCHARD** MACHINE COMPANY

64 STATE STREET, CAMBRIDGE 39, MASS., U. S. A.

SPEED UP
your stud setting

Faster, more economically in one continuous operation



Tool in position over the stud ready to start the drive.

MODERN SELF-OPENING STUD SETTER

This simple tool does your stud setting job in a single, quick, continuous operation. When the stud is driven to the desired depth, contact between the stop collar and the work releases the clutch, then lifting the tool off the stud automatically disengages the jaws. No reversing. No backing off the stud.

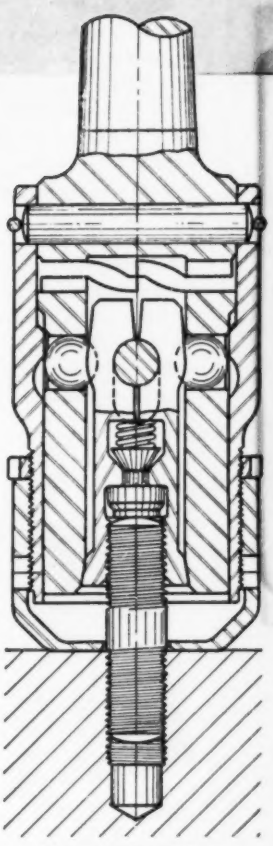
If you have studs to set in quantity, it provides a means to greater production volume at lower operating cost.

The action of the Modern Stud Setter is positive and entirely automatic. It can be operated in any position with either air or electrically operated portable tools. It is equally effective for use in drill presses where it is possible to drill and tap the holes and set the studs in successive operations.

Made in two sizes: ½" and ⅞" capacity.

Many automobile, truck, tractor and diesel engine manufacturers and others having studs to set in quantity rely exclusively on Modern Stud Setters.

Let Modern Engineers help with your stud setting problems. Full information will be furnished promptly upon request.



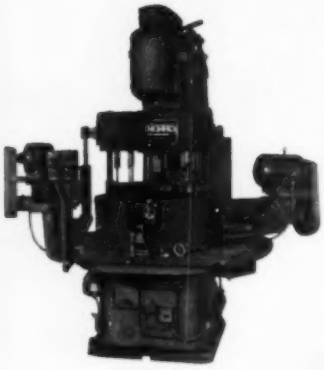
Drive completed. Jaws open automatically releasing the tool.

MODERN TOOL WORKS

DIVISION OF

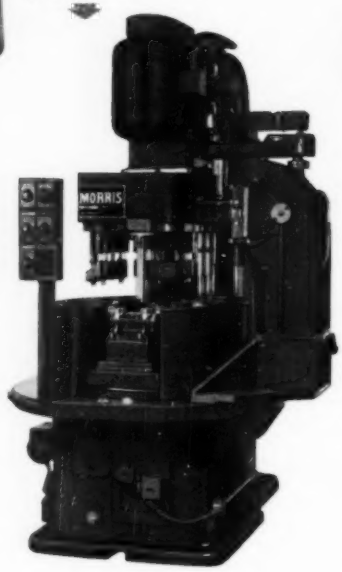
CONSOLIDATED MACHINE TOOL CORPORATION

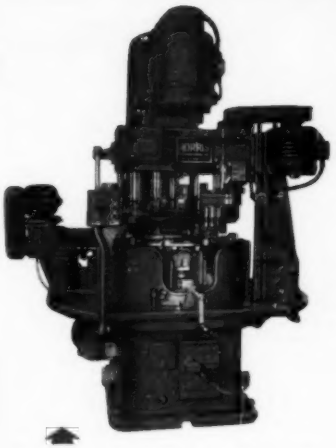
ROCHESTER 10, NEW YORK



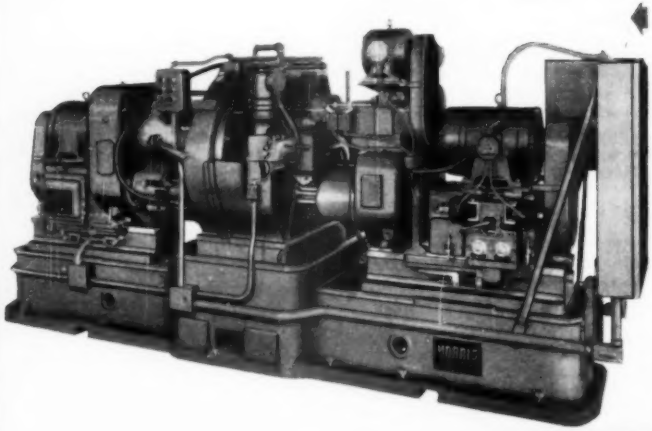
The machine above is a Hydraulic Vertical 6 Station Automatic Indexing Machine designed for drilling, reaming, counterboring and spotfacing operations on housings for automobile oil pumps. It is equipped with four vertical drill spindles —two vertical reaming spindles— one vertical counterboring spindle —one vertical spotfacing spindle and three horizontal drill spindles. Six hand clamp holding fixtures enable operator to load and unload machine easily and quickly at each indexing of table.

Here is shown a Vertical Four Station Automatic indexing machine arranged to drill, ream and tap two $\frac{5}{16}$-24 holes in universal joint races. It is equipped with four, two position, automatic clamping fixtures which enables operator to unload finished work and insert new pieces without interrupting production.

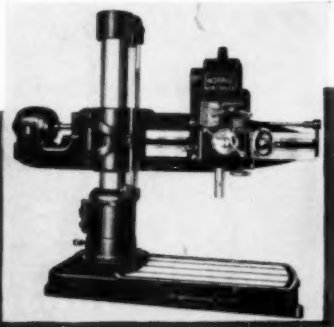




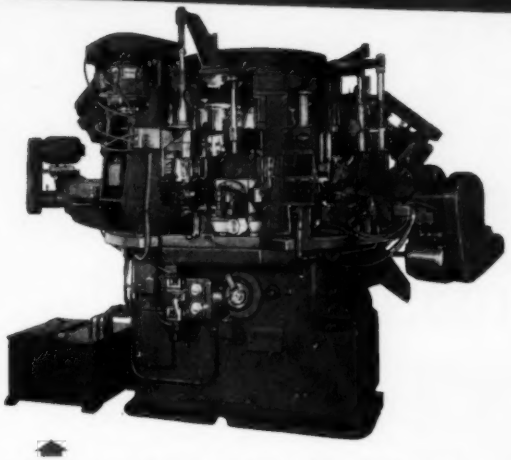
This 10 station Vertical Hydraulic Automatic Machine completes four operations—drilling—reaming—chamfering—tapping on an automobile Oil Pump Housing and turns out a finished piece at each index of the machine. The operator merely loads and unloads the work by means of a hand clamp arrangement which operates the ten hand clamp fixtures. The machine is equipped with twelve vertical drilling spindles, two vertical reaming spindles, four vertical tap spindles and one horizontal drill spindle all of which operate simultaneously on a work piece as it is indexed from one position to another.



Here's a Two Way Horizontal machine which drills, reams, countersinks and taps compressor cylinders for refrigerators. Equipment consists of two hydraulic feed units—fifteen spindles on both R.H. and L.H. Heads — a six station automatic indexing mechanism —and a three spindle tap head.

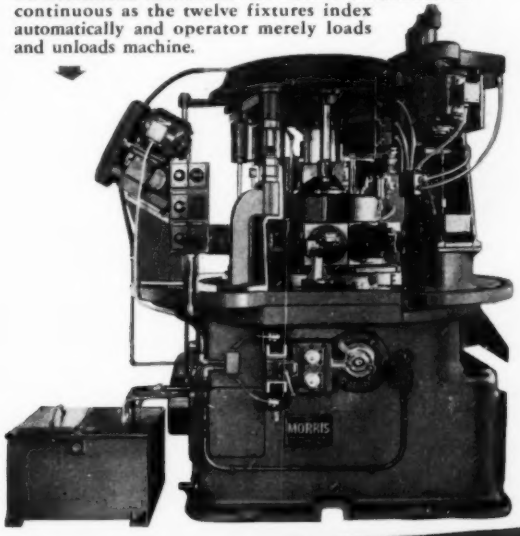


In the field, the name MORRIS has for many years been associated with the production of Radial Drills. Illustrated is one of their line of high quality—versatile machines available in 3'-4'-5' and 6' arm lengths on an 11" column. Write for bulletin.



This machine drills, taps, spot faces and reams carburetor bodies on a mass production basis. Of vertical design it has 12 automatic indexing four position fixtures, 20 drilling spindles, 7 facing spindles, 15 tapping spindles, 1 brush spindle and 4 reaming spindles and turns out a completed piece at every index of the turret.

Illustrating a Morris Center Column machine which performs six operations – drilling – reaming – facing – spot facing – chamfering and tapping simultaneously on automotive carburetor air horns. Production is continuous as the twelve fixtures index automatically and operator merely loads and unloads machine.



Reviewing MORRIS MOR-SPEED MACHINES for big Production

In analyzing manufacturers problems today there are many instances where the only sound answer to rising costs is greater production.

Over the past twenty-five years Morris has spent considerable time designing—developing—building high production machines each designed to meet specific job conditions.

On the accompanying pages are typical examples of machines built to help manufacturers get greater production at lower costs.

Look them over, perhaps they will suggest answers to some of your production problems. Morris has the experience, the engineering ability, and the facilities to help you on your mass production jobs. Contact them for specific data on your work.

Builders of MOR-SPEED Line

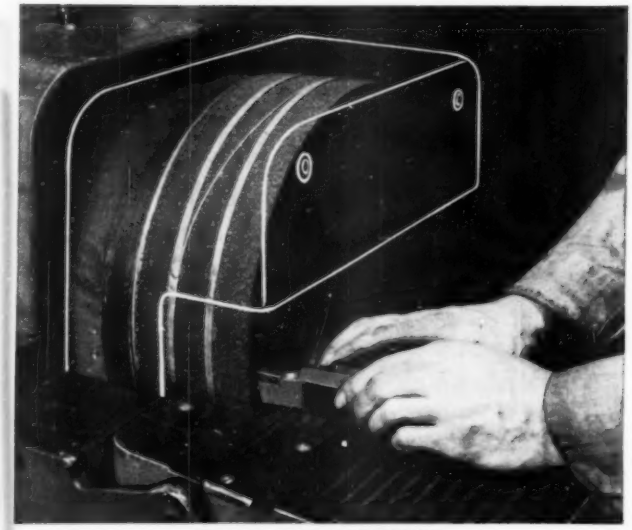
The MORRIS *Machine Tool Co.*

CINCINNATI 3, OHIO

BUXITE

GRINDING WHEELS FOR CARBIDE TOOLS

LIGHTER FEED... COOLER CUTTING



THE BUXITE PROCESS

(Formerly Controlled by The Bridgeport Safety Emery Wheel Co., Inc.)

The Buxite Process is a revolutionary method of coating **each individual grain** of Buxite wheels with a microscopically thin shell of carbon in an isotropic vitrescent form. Each shell permits its grain of abrasive to turn, exposing every cutting surface before it is worn away. Each succeeding layer of grains are contained in their individual carbon shells, assuring constant grinding action during the life of the wheel.

REPRESENTATIVES NOTE: There are a few desirable territories available to well qualified representatives. If you are interested, write us, giving full particulars of your operation and qualifications.

Buxite grinding wheels perform better and actually cut faster with light pressure. This means that carbides and other superhard steels can be ground with less heat being generated . . . which prevents checking and cracking, lengthening the life of the tools.

GRIND CARBIDE TOOLS AT 75% TO 85% LESS COST

Not only do Buxite wheels increase carbide tool life, but they give a cleaner grind and better finish. Buxite wheels do not "load" when grinding sintered tools, eliminating frequent stops for dressing, and the hard-shelled grains makes the life of each Buxite wheel 4 to 6 times that of ordinary wheels.

REDUCE DIAMOND WHEEL CONSUMPTION

The lighter cuts and cooler grinding action of Buxite grinding wheels results in excellent finish on Tungsten Carbide and other types of superhard alloys. Buxite wheels always reduce and frequently eliminate the need for diamond wheel grinding on this type of tool. This saving in diamond wheel consumption and costs is an important reason so many manufacturers and metal working shops have standardized on Buxite wheels for their tough grinding operations.

ADDITIONAL ADVANTAGES OF BUXITE WHEELS

Every feature of Buxite wheels contributes to faster production and lower piece cost on grinding operations involving super-hard tool steels. Faster, cooler cutting action, longer tool life, longer wheel life and reduction or elimination of diamond wheel consumption result in greatly lowered costs. If our representative has not called recently, write direct to us for additional information and money-saving facts.

MANSCO GRINDING WHEEL CO.

2164 EAST 36TH STREET — CLEVELAND 15, OHIO

Exclusive Suppliers of BUXITE *Grinding Wheels*

BUXITE

GRINDING WHEELS FOR CARBIDE TOOLS

MANSCO GRINDING WHEEL COM

2164 EAST 36th STREET — CLEVELAND 15, OHIO

Important Announcement

Industries Grinding Carbide Tools
Everywhere, United States

Gentlemen:

We realize that all BUXITE grinding wheel users are concerned about the future supply of BUXITE wheels for grinding carbides and other tough steels.

We hasten to assure you that there will be no interruption in the availability of BUXITE wheels.

We were very glad indeed when we were asked to accept exclusive control of the BUXITE process for the United States. We are immediately pressing for additional production of BUXITE wheels in a wide range of grain sizes for all standard carbide grinders.

Through the engineering and sales of thousands of BUXITE wheels to the industry in the Middle West, we are thoroughly familiar with the application and advantages of these "case hardened" wheels.

Our Cleveland warehouse stocks are immediately available to you and we will try to meet all of your requirements. In addition, please call on us for any help or service you think our engineers can give.

We believe the acquisition of the BUXITE process contract to be one of the most important things that has happened to us in our 25 years in the grinding wheel business. Knowing, first hand, the thousands of dollars our customers have saved in diamond wheel consumption through the use of BUXITE wheels, we anticipate with pleasure making them available to industries throughout the United States.

Don't hesitate to write us if we can be of service.

Yours very truly,
George Kramer
MANSCO GRINDING WHEEL CO.

EXCLUSIVE SUPPLIERS OF BUXITE GRINDING WHEELS

MANSCO GRINDING WHEEL CO.

2164 EAST 36TH STREET — CLEVELAND 15, OHIO

Exclusive Suppliers of BUXITE Grinding Wheels

Van Keuren Precision Products

THREAD AND GEAR MEASURING WIRES

The recognized standard everywhere for measuring screws, gears, worms, hobs, splines, serrations and angles. If you are in doubt about measuring problems send in your blueprints for recommendations.

FUSED QUARTZ OPTICAL FLATS OF SUPREME ACCURACY

WIRE TYPE PLUG GAGES

ORIGINATED BY VK IN 1925

MADE IN

ALLOY STEEL
HIGH SPEED STEEL
CHROMIUM PLATE
CARBOLOY

Giant's Grip Handle ½" to 1" range

Safety Bushing .020" to .500" range

Wafer Type Handle .001" to .020" range

THE Van Keuren COMPANY,

30th YEAR

are GOING OVER BIG

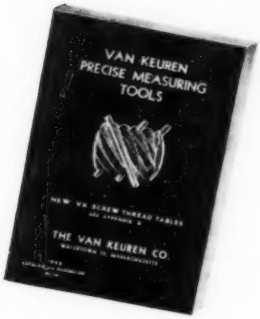
THE NEW 7/8"
MICROGAGES

60% MORE WEARING SURFACE
25% GREATER ACCURACY

NO INCREASE IN PRICE

MICROGAGE MICROMETER SET
M21 · $60.00
1, 2, 3, 4, 5, 6"

WHERE ELSE CAN YOU BUY 5" AND 6" GAGE BLOCKS?



CATALOG AND HANDBOOK No. 34

This 208 page volume represents 2 years of research sponsored by the Van Keuren Co.

It presents for the first time in history a simple and exact method of measuring screws and worms with wires.

It tells how to measure gears, splines and involute serrations. It is an accepted reference book for measuring problems and methods.

Copies now free upon request.

176 WALTHAM STREET WATERTOWN, MASS.

Light Wave Equipment • Light Wave Micrometers • Gage Blocks • Taper Insert Plug Gages • Wire Type Plug Gages • Measuring Wires • Thread Measuring Wires • Gear Measuring System • Shop Triangles • Carboloy Plug Gages • Carboloy Measuring Wires

THE NEW GRAY IS MOST ACCOMMODATING

FOR PRODUCTION VERSATILITY

THE NEW GRAY ADJUSTABLE— CONVERTIBLE— OPENSIDE PLANER

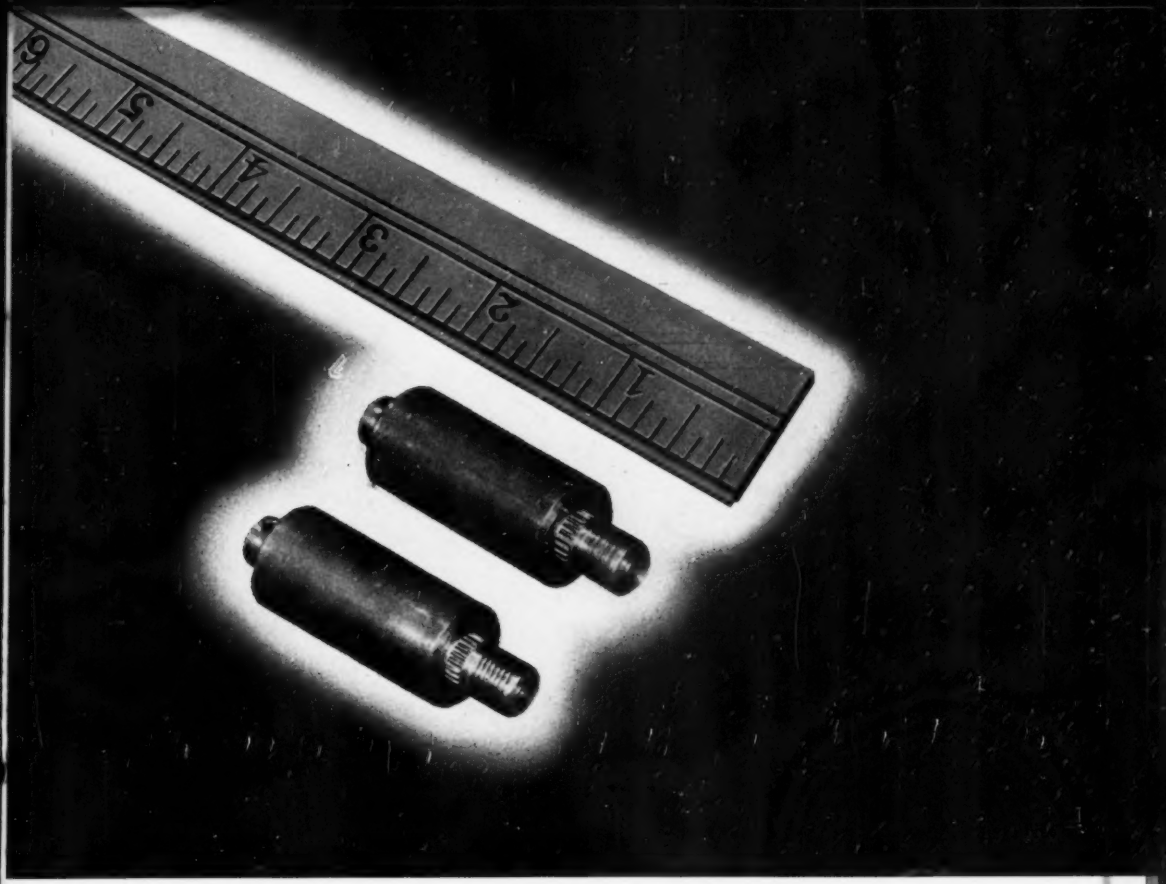
This new Gray accommodates wide or narrow jobs with ease. The outboard housing is adjustable and can be easily positioned to permit the most effective use of the L. H. Side Head. For extra wide jobs the housing may be completely removed. Automatic power clamping secures the Knee to the column and the rail to the housing. The New Gray "Adjustable-Convertible" is designed to handle those jobs that are too large for a small planer yet too small for a large planer. This development plus a host of others warrants your investigation of the New Gray.

BETTER INVESTIGATE THE NEW GRAY ADJUSTABLE OPENSIDE PLANER

The G.A. **GRAY** *Company*

planers • milling planers
planer type milling machines
horizontal boring machines

CINCINNATI 7, OHIO, U. S. A.
SOLD IN CANADA BY UPTON, BRADEEN AND JAMES, LTD. • SOLD IN LATIN AMERICA BY MACHINE AFFILIATES



Steps up output on automatics . . .

THE PARTS shown above are produced and used by a Michigan company in the manufacture of lawn mowers. The parts are made from ¾-inch bar stock of 1030 steel on a Cleveland single-spindle automatic. To make these lawn mower axles, the operations required are forming, knurling, threading, and cut-off.

In order to maintain a daily output of 500 to 600 lawn mowers, a high production rate was required on these parts. Various cutting oils were tried in an attempt to reduce tool wear and step up production. One product—Stanicut 137 BCS Cutting Oil—brought results that far exceeded those of the other oils. It increased tool life 30% over the best of previous results.

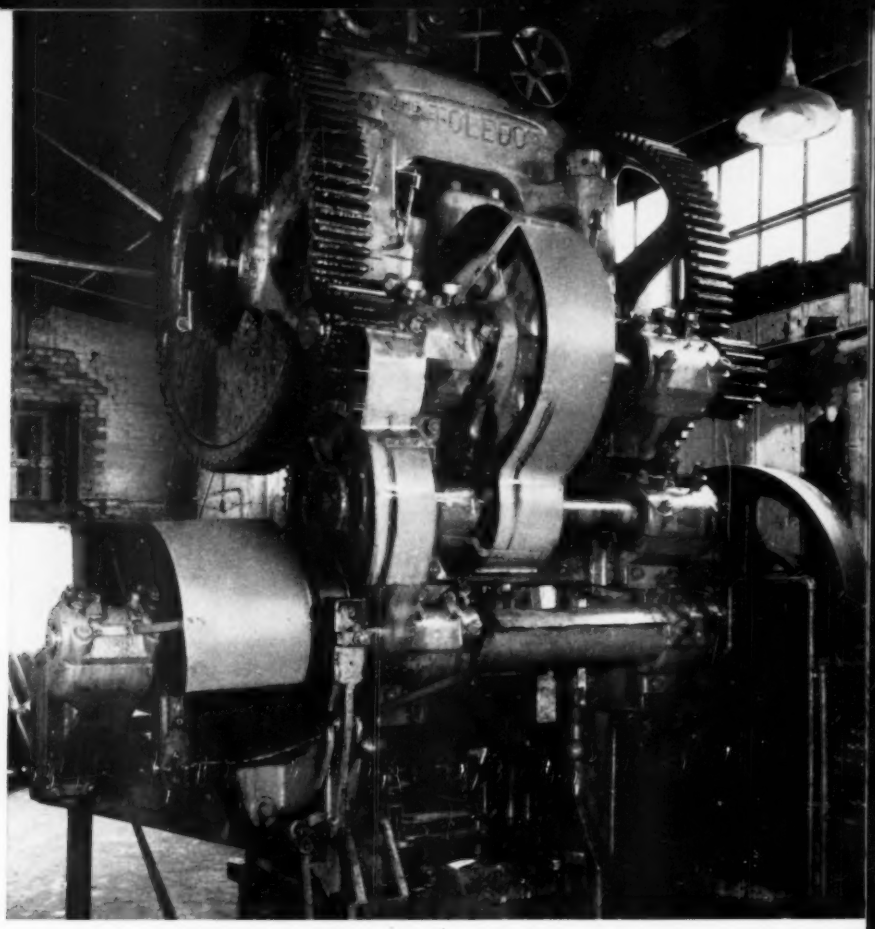
Stanicut Cutting Oils are effectively compounded to help your tools and machines handle the most difficult machining operations. To get the best possible tool life, accuracy, and finish on jobs involving soft metals or hard alloys, try these superior cutting oils. A Standard Oil Cutting Oil Engineer will help you choose the right oil for the job.

Stanicut 137 BCS Cutting Oil

If your plant is located in the Midwest, write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois, to secure the services of the Engineer nearest you.

STANDARD OIL COMPANY (INDIANA)

STANDARD



Where gears are open for trouble, try...

THE exposed gears on stamping machines were a source of considerable trouble in a midwest plant. Noisy operation and lubricant throw-off created an undesirable working condition for the press operators. Moreover, gears required frequent applications of grease, interfering with production and raising lubricant consumption.

Conventional greases, tried on the gears, failed to remove the difficulties. A Standard Oil Lubrication Engineer suggested the use of Calumet Viscous Lubricant No. 2X, a grease of superior adhesive quality. This lubricant clung to the gears, eliminating drippage and throw-off troubles. Fewer applications of the grease were required. Gear operation was smoother and quieter.

Where open gears, as well as some enclosed types, are difficult to lubricate, try Calumet Viscous Lubricants. Unlike many conventional gear shields, these lubricants are true greases, fortified with additives. Their superior adhesive quality and greater wetting ability

Calumet Viscous Lubricants

give them high resistance to the washing action of water and to thinning and throw-off at high temperatures. All grades of Calumet Viscous Lubricants can be applied without heating, and all but the heaviest grade can be applied by spraying.

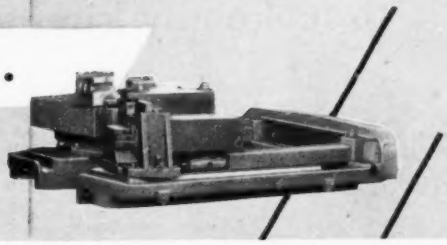
If your plant is located in the Midwest, write Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Ill., to secure the services of the Standard Oil Lubrication Engineer nearest you.

STANDARD OIL COMPANY (INDIANA) STANDARD

THE GISHOLT SIMPLIMATIC

AUTOMATIC LATHE

THIS PLATEN TABLE...



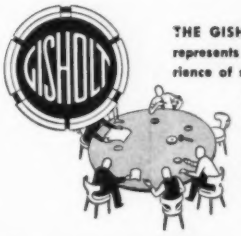
...OR THIS PLUNGE AND RADIAL HEAD

May save you the cost of a special machine... *Investigate it!*

THE SIMPLIMATIC—An automatic, single spindle, chucking lathe—adaptable to a wide variety of work that is produced in quantity.

—*with* **PLATEN TABLE** it provides a horizontal mounting using various tool slide arrangements for straight and angular turning, boring and facing cuts.

—*with* **PLUNGE AND RADIAL HEAD** it provides vertical tool mounting in front of the work with a minimum tool overhang; for combined operations on parts of large diameter with wide faces.

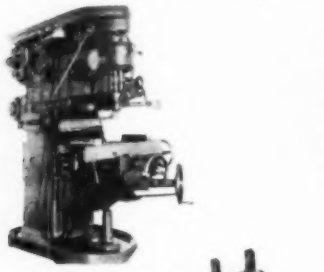


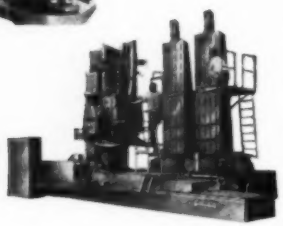
THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

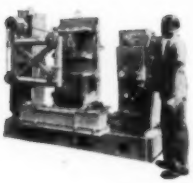
GISHOLT MACHINE COMPANY
MADISON 10, WISCONSIN

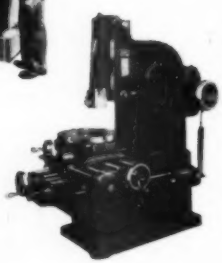
TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

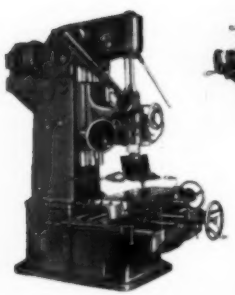
Now Pratt & Whitney supplies everything you need to make any kind of die or mold

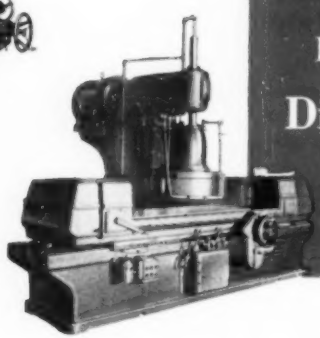












From a single source — Pratt & Whitney — flows everything you need to make any kind of die or mold of any type or size. The fact that it's *Pratt & Whitney* means you get *precision equipment* of right design produced by skilled craftsmen working to a single high standard of precision and quality. And the fact that Pratt & Whitney is the *single source* means you get *unified responsibility* for the performance of machines and equipment, better results at lower cost, and no buck-passing when you need help. Write for detailed literature. No obligation, of course.

1. DIE SINKERS — Plain and Universal — for making original dies and molds by conventional methods, from drawings or prints.
2. KELLER MACHINES, for making original dies and molds from master forms, using automatic tracer control. In seven sizes up to 12′ x 6′ capacity.
3. AUTOMATIC DUPLICATING MACHINES, for duplicating small and medium-large dies and molds automatically and economically.
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5. JIG BORERS, for precision-boring of punch and die sets and intricate molds and dies, of all kinds.
6. VERTICAL SURFACE GRINDERS for rough or finish grinding of almost any material. Provides exactly the right table speed for each job. Available in several sizes.
7. KELLERFLEX MACHINES — flexible shaft equipment for efficient finishing of dies and molds. Both multi-speed and direct drive types, in 14 models.

NOT ILLUSTRATED: JIG GRINDER, for relocating and finish-grinding straight or tapered holes to "tenths," in hardened steel. KELLER CUTTER AND RADIUS GRINDER: sharpens die-sinking and Keller cutters, shapes Keller tracer points. VERTICAL DIE GRINDER: prepares new die block surfaces prior to machining, sharpens dull dies, reconditions die block faces before resinking operations. BURS (rotary files): used in Kellerflex and similar machines, for finishing jobs. P&W furnishes hundreds of styles, shapes, sizes in both high-speed steel and carbide, plus grinding and polishing wheels, etc. SMALL TOOLS: including die-sinking cutters, Keller cutters and tracer points, drills, reamers, counterbores, end mills for jig borers. P&W GAGES: entire range of cylindrical gages, thread gages, snap gages, precision gage blocks, and basic measuring equipment.

PRATT & WHITNEY
Division Niles-Bement-Pond Co.
WEST HARTFORD 1, CONNECTICUT

PRATT & WHITNEY
Die-and Mold-Making Equipment

"There is no better-paying investment than the right tools for the job"

. . . in one setting . . . in 10 minutes . . . 19 separate operations!

ON THE POTTER & JOHNSTON 6DRE AUTOMATIC

—*that's tooling for you*

—the kind of time and money saving tooling that production-minded executives and engineers have learned to look for when they put it up to Potter & Johnston.

You can never be sure that your parts production is accomplished the fastest, most accurate, most economical way until you let P&J engineers have a look at the parts or prints and compare their tooling recommendations and time estimates with what you're doing now. Why not see what they have to say. It puts you under no obligation.

The Steel Forged Oil Well Drill Bit pictured above is gripped by a 3 jaw chuck, and here is what happens to it on the P&J 6DRE Automatic:

1st T. F.: Drill inside dia. to depth; turn O.D. straight to chuck jaws; remove portion of stock from bevel.

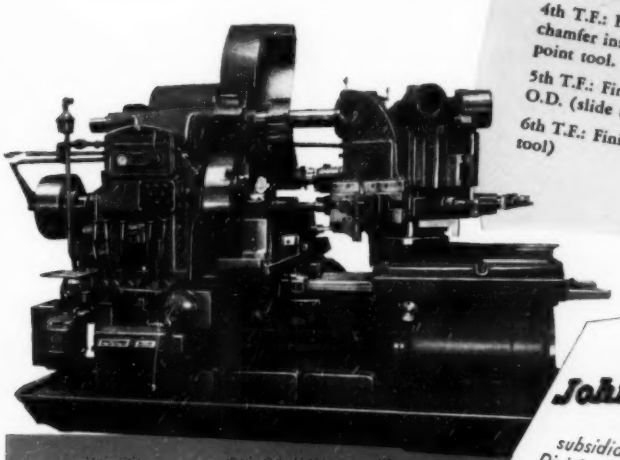
2nd T. F.: Rough bore two inside dias. and face bottom of one dia.; remove portion of stock from bevel.

3rd. T.F.: Form radius and angle on outside dia.; remove remaining rough stock from bevel; rough face end; rough C'bore 3.798" dia.

4th T.F.: Finish bore three inside diameters, chamfer inside dia.; machine bevel with single point tool.

5th T.F.: Finish bore inside dia.; turn taper on O.D. (slide tool)

6th T.F.: Finish face end; form ball race (slide tool)



Potter & Johnston Company
Pawtucket, R. I.
subsidiary of Pratt & Whitney
Division Niles-Bement-Pond Company

P&J

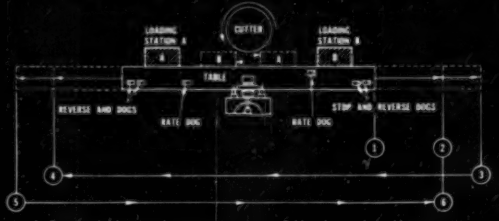
6DRE AUTOMATIC

Talk about production! Here's picture-proof of reciprocal milling on a standard knee-type Kearney & Trecker 30 hp No. 3 CSM machine with Automatic Table Cycle and *Mono-Lever* control. Using Automatic Table Cycle, machine turns out hundreds of these forged parts with operator merely loading and unloading workpieces. Actual savings 31%.

Plain Facts Prove Why . . . THESE TIME UP TO 31% - PAY

HOW JOB IS DONE

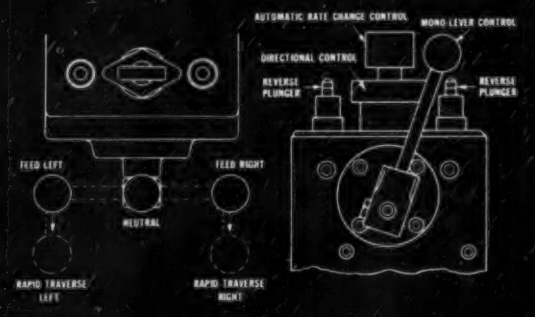
USING AUTOMATIC TABLE CYCLE AND MONO-LEVER CONTROL



1. Operator loads (A) and engages Mono-Lever. Table advances in rapid traverse to point of cut on workpiece (A) at (2).
2. Feed dog changes rapid traverse to selected table feed for cut on (A). Operator loads at station (B).
3. Upon completion of cut stop and reverse dogs reverse table in rapid traverse to point of cut on workpiece (B.
4. Feed dog changes rapid traverse to selected table feed on (B). Operator unloads and reloads at Station (A).
5. Stop and reverse dogs reverse table in rapid traverse to point of cut on workpiece (A).
6. Cycle repeats from (2).

HOW IT WORKS

AUTOMATIC TABLE CYCLE and MONO-LEVER CONTROL UNIT



LOOK AT THE JOB at left—the diagram tells how it's done. Table feed screw with adjustable nut eliminates backlash, so climb and conventional cuts are taken with equal ease. Cycle pre-set to fit operator's required load and unload time.

THINK OF IT! Now you can have all the advantages of this great cost-cutting feature plus the all-around versatility of general purpose, knee-type machines . . . faster, easier control for greater production with less operator fatigue.

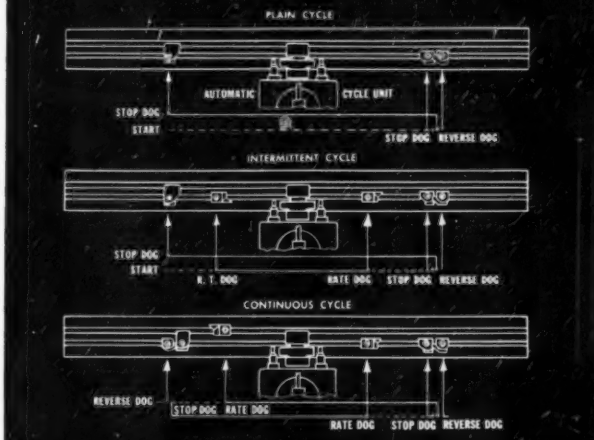
"HOW can you reduce floor to floor time on nearly all types of general purpose milling operations?"

Kearney & Trecker's research and development—always directed at getting greater production at lower costs—found a new answer to that question. It's Kearney & Trecker's new line of standard knee types with Automatic Table Cycle and *Mono-Lever* control.

They simplify hand control of the table to the simple movement of ONE LEVER—thereby substantially reducing idle cutter time and operator fatigue. They combine the all-around versatility and working range of knee-type designs with the automatic, high production feature of bed types.

Of equal importance to you is the opportunity for proper machine selection. You neither *over-buy* nor *under-buy*, but you buy *right* when you choose from the *56* machines in this new Kearney & Trecker line. For some startling facts about these machines and their application to your milling work, consult a Kearney & Trecker Sales Representative today. He's been schooled in the "know-how" and he's at your service. For detailed information, contact him or write us direct. Ask for Catalog No. AC-10A. Kearney & Trecker Corp., 6784 W. National Ave., Milwaukee 14, Wis.

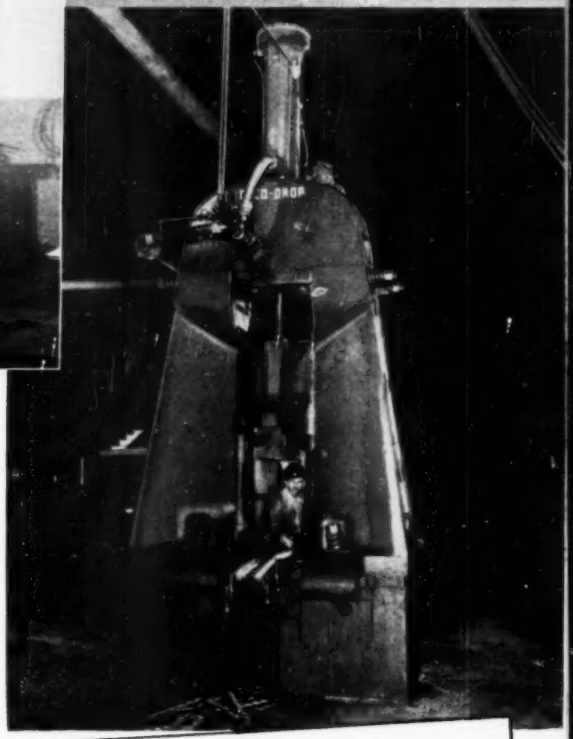
TYPICAL CYCLES YOU CAN USE



THREE DIFFERENT TYPICAL CYCLES to accommodate various job setups. Using the completely automatic cycle feature effects savings of up to 31% for lots of 10 or more pieces. Cycle can be set for loading and unloading time—and can be reversed in feed or rapid traverse.

MACHINES CUT CYCLE THEIR WAY FASTER!

The Fulfil
OF THE
CECO-



In shop after shop, over the past two years, the CECO-DROP has proved

- **IT FORGES MORE MINUTES PER HOUR**
- **IT COSTS LESS TO OPERATE**
- **IT IS SAFER**
- **RE-ORDERS TELL THE STORY**

The Ceco-Drop is a gravity drop hammer in which the ram is lifted by air or steam rather than by friction operated boards. There are fewer operating parts, shock-absorbing mechanisms are employed, lubrication is automatic and operation is simple and safe.

...ment OF THE PROMISE

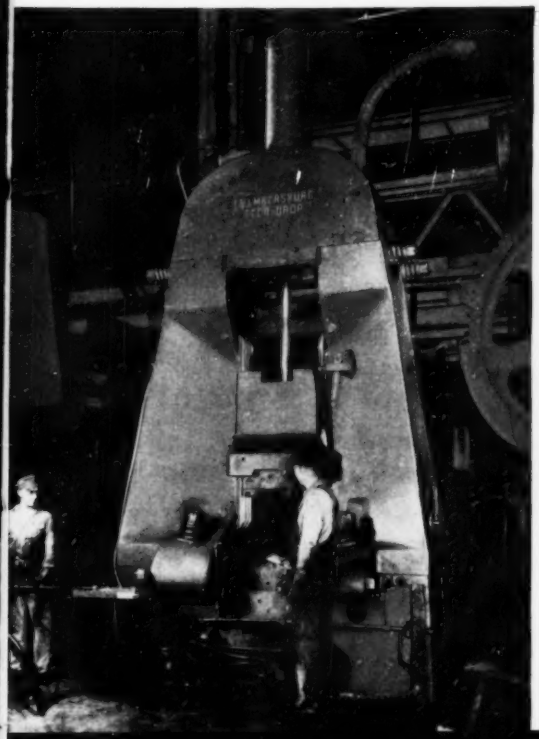
...-DROP

SHOP RECORDS

(Facts on File . . . Ask for Details)

"The Ceco-Drop produces 35% more forgings than our board drop hammers."

"The Ceco-Drop made 5100 pieces in a 9-hour shift . . . the board drop 3700."



"The men in the shop are all for it."

• • • •

218 pieces per hour on a board drop hammer. 222 to 250 pieces per hour on the Ceco-Drop.

• • • •

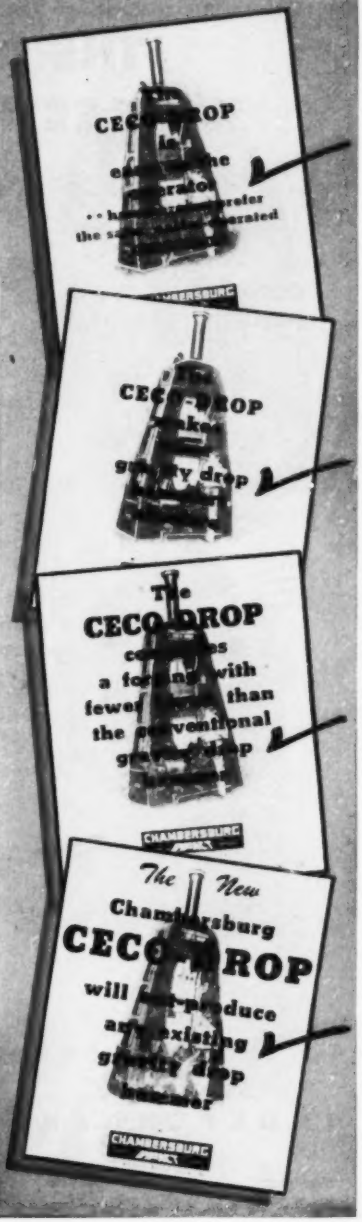
"The superintendent calls it 'The Hammer of the Future'."

• • • •

"Original rod is still in use . . . after a year's service."

• • • •

"More and better forgings than on our board drops."



CHAMBERSBURG ENGINEERING CO.

Builders of Impact Machinery Since 1897

CHAMBERSBURG, PENNSYLVANIA

THOR'S GREAT NEW

THE MOST POWERFUL 3/8" ELECTRIC IMPACT WRENCH EVER BUILT!

COMBINING TWO PROVED FEATURES!

The powerful, durable striking mechanism—of the same type so widely preferred in Thor *pneumatic* impact wrenches.

The famous Thor heavy duty electric motor . . . standard in Thor electric tools for 35 years.

See your Thor Distributor or Jobber today, or write for Circular No. 1025

INDEPENDENT PNEUMATIC TOOL COMPANY

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"PACKY"

A 1 2 PUNCH THAT DELIVERS EFFICIENCY FOR

NUT SETTING • SCREWDRIVING • DRILLING IN STEEL, WOOD, MASONRY • TAPPING REAMING • HOLE SAWING • SANDING

The complete versatility of this great new Thor tool makes it a "must" for every production line, factory maintenance, garages, engine rebuilding shops . . . *wherever* power can get jobs done cheaper—faster!

LEADER OF THE NEW THOR *Silver Line* ELECTRIC TOOLS

NEW 1-½", 2-½", 3" and 4" DRILLS
NEW 4", 5", 6" PORTABLE GRINDERS
NEW 7" AND 9" STANDARD AND HEAVY DUTY SANDERS
NEW 7" STANDARD AND HEAVY DUTY POLISHERS

Thor PORTABLE POWER TOOLS

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

BARNESDRIL *Offers* UNIT-TYPE OPERATION•

FOR REMOVING METAL

▲ Three Vertical No. 15 Units, 5-station automatic index table, automatic cycle for Drilling, Reaming, Countersinking, Boring, Chamfering and Tapping.

Unit-Type machining around a common index table, faster cycling, hydraulic actuation, engineered timed cycle control — these features in new **BARNESDRIL** Production Machines actually give you ⅓ more productivity than ever before. In some cases even 50% gain has been proved.

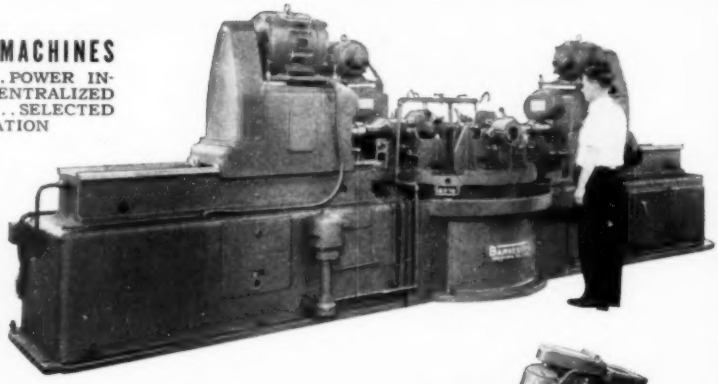
For, Unit-Type operation combines multiple machining cuts into a single production set-up—with savings in equipment, floor space and investment.

Automatic cycling shortens operation time and eliminates wasteful loading and

HIGH PRODUCTION UNIT-TYPE MACHINES

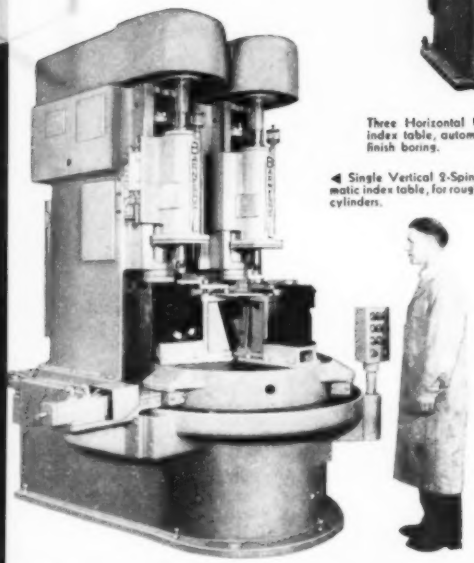
ANTI-FRICTION SPINDLE BEARINGS... POWER INDEXING OR DRUM TYPE TABLES... CENTRALIZED CONTROL PANEL... INFINITE FEEDS... SELECTED SPEEDS... AUTOMATIC LUBRICATION

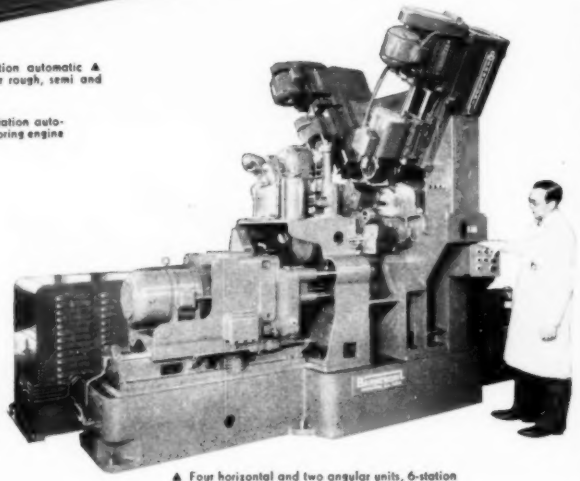
Write for Bulletin **B1504.**



Three Horizontal Units, 4-station automatic ▲ index table, automatic cycle for rough, semi and finish boring.

◀ Single Vertical 2-Spindle Unit, 3-station automatic index table, for rough and finish boring engine cylinders.





▲ Four horizontal and two angular units, 6-station drum-type index table, automatic cycle for Drilling, Reaming, Chamfering, Facing and Tapping.

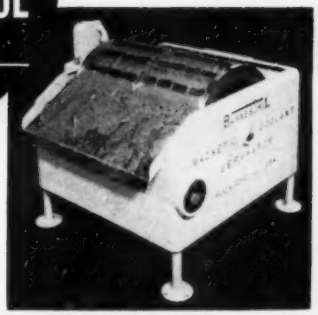
AUTOMATIC CYCLING • TIMED-CYCLE CONTROL

FASTER • EASIER • WITH LESS COST

transfer time — makes it easier for the operator.

Timed-cycle control produces rates of output up to the capacity of the operator — with more earnings for him, less cost to you.

Consult your **BARNESDRILL** Sales Engineer and ask him how these savings can be applied to your production problems. Complete details and information are also contained in new catalog No. 4. Write for your copy now.



MAGNETIC COOLANT SEPARATORS

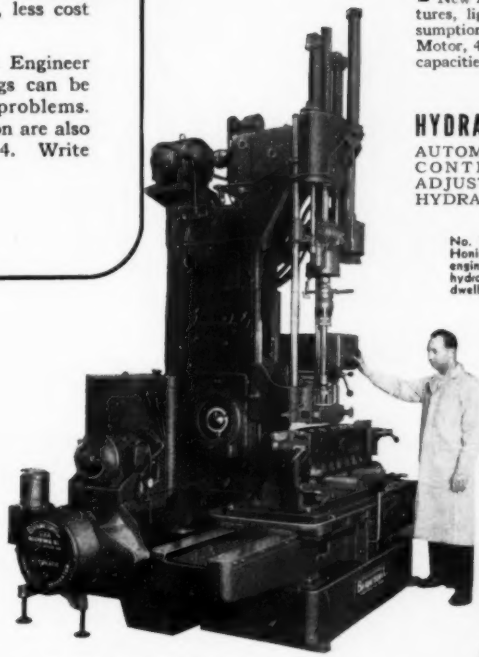
▲ New Improved models offer floor saving features, light weight, and reduced power consumption. No. 4 shown operates with 1/20 H.P. Motor, 40 gallons per minute capacity. Other capacities available from 5 to 350 gallons.

HYDRAULIC HONING MACHINES

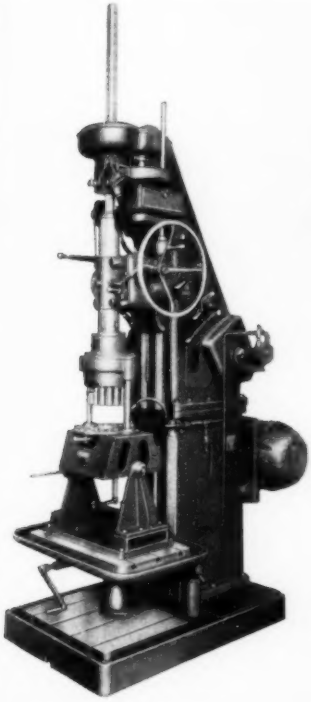
AUTOMATIC CYCLING... REMOTE CONTROL HONE EXPANSION... ADJUSTABLE STROKE CONTROL... HYDRAULIC DWELL.

Write for Bulletin B1214.

No. 224 Single Spindle Hydraulically Reciprocated Honing Machine tooled and equipped for honing small engine cylinders up to 4" diameter. Machine has hydraulic step-feed hone expansion and hydraulic dwell at bottom of stroke. ▼



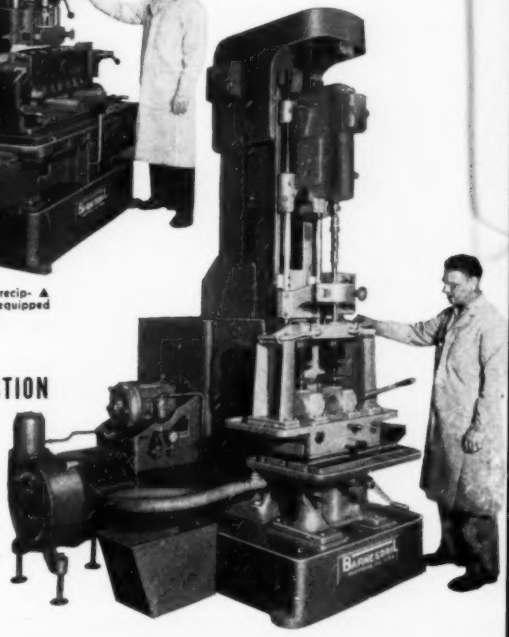
No. 4014 Single Spindle Hydraulically reciprocated Honing Machine, tooled and equipped for honing diesel locomotive cylinders. ▲



◀ STANDARD HIGH PRODUCTION DRILLING MACHINES

SIZES UP TO 4" CAPACITY IN STEEL
DRILLING, REAMING OR TAPPING
MANUAL OR AUTOMATIC OPERATION

Write for Catalog B1204.



BARNES DRILL CO.

820 CHESTNUT STREET ROCKFORD, ILLINOIS U.S.A.

May We Send You...

GORTON 2-28B

for

HEAVY-DUTY PRODUCTION WORK

NOTICE FULLWIDTH KNEE and compare with width of conventional knees.

FIRST No. 2 MILL TO FEATURE *Fullwidth* KNEE

..Complete Information

Send for Bulletin 2321
today—see the extra value built into this production tool

All-New 10 H.P. *Fullwidth* No. 2 Horizontal PLAIN TYPE Milling Machine

OUTSTANDING FEATURES

NEW in design; in construction; in performance.

DESIGNED AND BUILT as a correlated unit to do heavier work better and to take full advantage of extra power provided.

10 HORSEPOWER — PLUS: Full ten horsepower is delivered to the spindle; separate motor drives table, saddle and knee.

FULLWIDTH KNEE: Top knee bearing is almost twice as wide as on conventional No. 2 mills — see illustration at left. Rigidity closely approaches that of bed-type machines.

SQUARE LOCK BEARING SURFACES with narrow center guides guard against knee tipping and saddle "cocking".

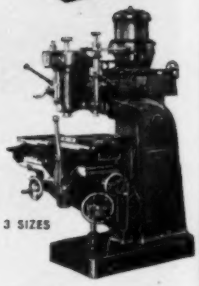
RIGID SADDLE: Saddle bearing spread on knee almost equals table travel. Four solid ribs reinforce saddle structure.

PRECISION BALANCED SPINDLE provides mass and weight of metal close to spindle nose with built-in flywheel action, but without superfluous parts.

OTHER FEATURES: Efficient, simplified gear train; full directional controls; automatic lubrication; simplified coolant system; improved electrical controls — all these provide a rugged machine built to do a bigger and better job on the production line. Write for complete information today — see bulletin illustrated above.

GEORGE GORTON MACHINE CO.
Tracer Controlled Milling
1501 RACINE STREET • RACINE, WISCONSIN, U.S.A.

OTHER PRECISION MACHINES BY GORTON



Die and Mold Duplicators
Send for complete information about Gorton Die and Mold Duplicators for profiling and duplicating all kinds of dies and molds for plastics, rubber, glass, drop forging dies, metal patterns and die castings.

Pantographs for Dies — Molds — Hobs — Engraving
Write for Gorton Pantograph bulletin which gives complete information on all sizes available.

Automatic Lathes — write for descriptive bulletin

Carpenter Stainless No. 20

NOW

Making Stainless More Useful To You . . . and making Stainless cost less for you to use . . . have been the ideas behind Carpenter's research in Stainless. As a result of that research, free-machining Stainless was invented in Carpenter's laboratories. The first bright and ductile Stainless strip was developed by Carpenter men . . . and now "Stainless 20"

Carpenter Stainless No. 20 Tubing and pipe sizes produced by Alloy Tube Division, The Carpenter Steel Company, Union, New Jersey

to Resist SULPHURIC ACID!

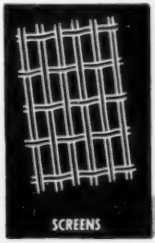
Now a New Stainless Steel Ready to Take on New Jobs...

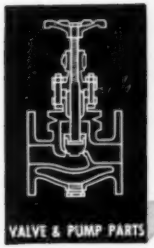
Here is news about a highly corrosion-resistant alloy available for the first time in the forms of bars, wire, strip and tubing.

In the past, the alloy has been available only in the cast form, known as Durimet 20. Now that Carpenter has overcome the problem of producing this alloy in the wrought form, its usefulness in solving corrosion control problems has been greatly increased.

There are two general types of applications in which Carpenter Stainless No. 20 can provide new and increased economy. First, in processes where sulphuric acid solutions are present at various temperatures and in various concentrations. And second, in handling other highly corrosive acids and solutions where an extra margin of safety is required, over and above the corrosion resistance provided by other types of Stainless Steel.

Your inquiries and orders for Carpenter Stainless No. 20 will receive prompt attention. If you care to investigate the corrosion resistance of the material under actual operating conditions, we will be glad to work with you on sample orders.

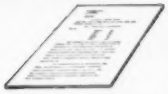




Typical Uses for Carpenter Stainless No. 20

Corrosion Resistance and Physical Properties Data...

These data pages will give you useful information on Carpenter Stainless No. 20 and the jobs it can do. For your copy, just drop us a note on your company letterhead, indicating your title, and ask for the Carpenter Stainless No. 20 data pages. We will be glad to put them in the mail for you.



THE CARPENTER STEEL COMPANY • 103 W. BERN ST., READING, PA.

Export Department: 233 Broadway, New York 7, N. Y. "CARSTEELCO"

Carpenter

STAINLESS NO. 20

Licensed under patents of The Duriron Co., Inc.

Carpenter Stainless No. 20 is available in the forms of bar stock, wire, strip and tubing.

STERL

WHERE GRINDING WHEELS TO SATISFY YOUR SPECIFIC

TRANSLATING the ability and experience of your consulting Sterling engineer into the finished grinding wheel is an easy assignment for Sterling technicians. Given the basic demands of your special grinding job—some information about the billet, casting, or the shape of the part and the alloy out of which it is made—these trained men can readily apply the benefit of their many years of technical observation to the quick, accurate solution of any of your troublesome grinding problems.

Sterling carries thousands of different wheels in stock. However, Sterling engineers usually do not recommend these stock wheels to meet your difficult job demands, but create a special "Wheel of Industry," planned, designed, and manufactured for you alone!

Sterling's New Research and Development Program is a goal toward which we have been working for years. Now, it is ready! By applying its advantages to your needs, you are assured better and quicker service on all your grinding jobs—regular and special—plus definite, pre-determined results.

Sterling's New Research and Development Program provides you with something unusual . . . something you have wanted for a long time. Its many advantages can be readily explained by a Sterling engineer. Write or wire for this service at no obligation.

Sterling Research and Development In Action

FIRST STEP . . . After studying your grinding problem in your plant, the Sterling engineer brings his findings to the Sterling Technical Director.

SECOND STEP . . . The Sterling Technical Director, after analysis and tests, submits your grinding problem to the Sterling Committee for group recommendation.

THIRD STEP . . . Back in the Sterling laboratory, the Committee's recommendations are analyzed and take form in special test mixtures of grain and bond.

FOURTH STEP . . . The resulting wheel on your machine, built to the specifications of your job, proves the wisdom and economy of Sterling's Research and Development Program.

THE STERLING GRINDING WHEEL DIVISION

of

THE CLEVELAND QUARRIES CO.

TIFFIN, OHIO

Since 1885, Manufacturers of "The Wheels of Industry"

ING

ARE "TAILOR-MADE" JOB DEMANDS . . .

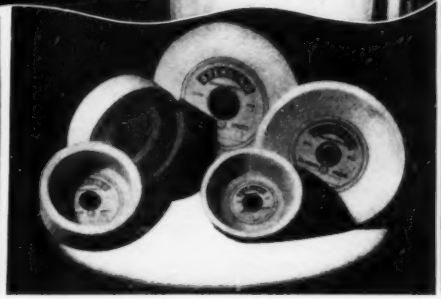
Four Sterling Research and Development folders, now at the printers, will soon be available. Write and reserve your copies NOW.

"THE WHEELS OF INDUSTRY"
STERLING
GRINDING WHEELS

AN EXAMPLE OF STERLING'S PRODUCT DEVELOPMENT TECHNIQUE

In the view above, Sterling technicians are testing grinding wheel structures for tensile strength as well as modulus of rupture, elasticity and resiliency.

Similar attention to every detail results in expert, economical grinding service from Sterling Tool Room Wheels and all the other "Wheels of Industry." Built to your specific needs, they produce.



FOSDICK PRECISION

1 The new Fosdick Sensitive Radial built in 3′ and 4′ sizes.

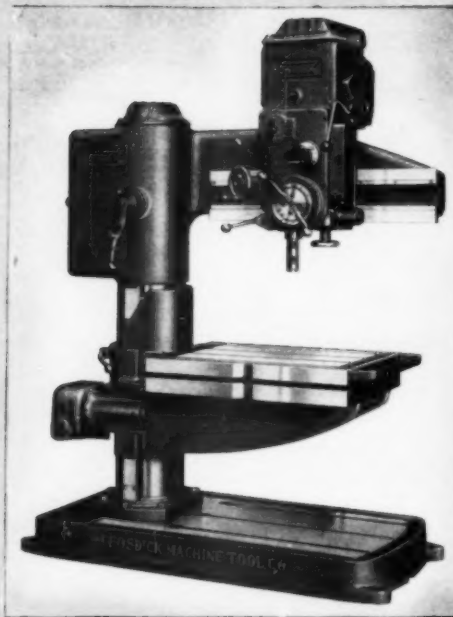
2 Improved Hydraulic Radial built in 11″ to 19″ columns.

3 Fosdick improved Jig Borer.

4 Fosdick Economax Upright Drill furnished with box and round columns.

5 Fosdick four spindle High Speed Drill.

6 New 21″ B.M. Fosdick Upright Drill.



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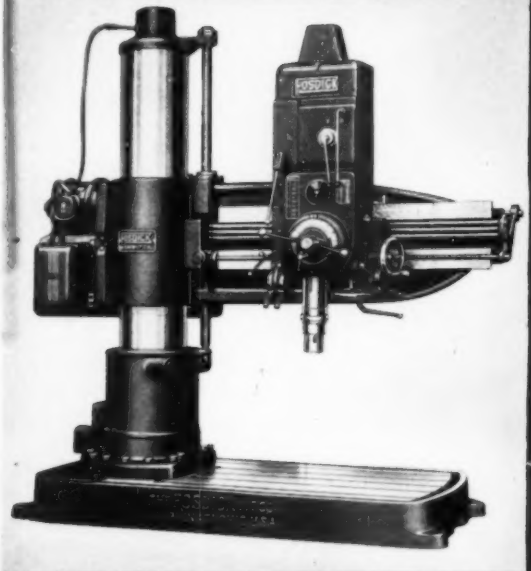

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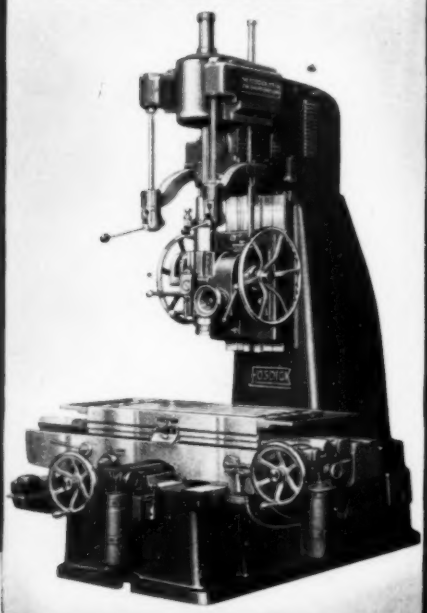


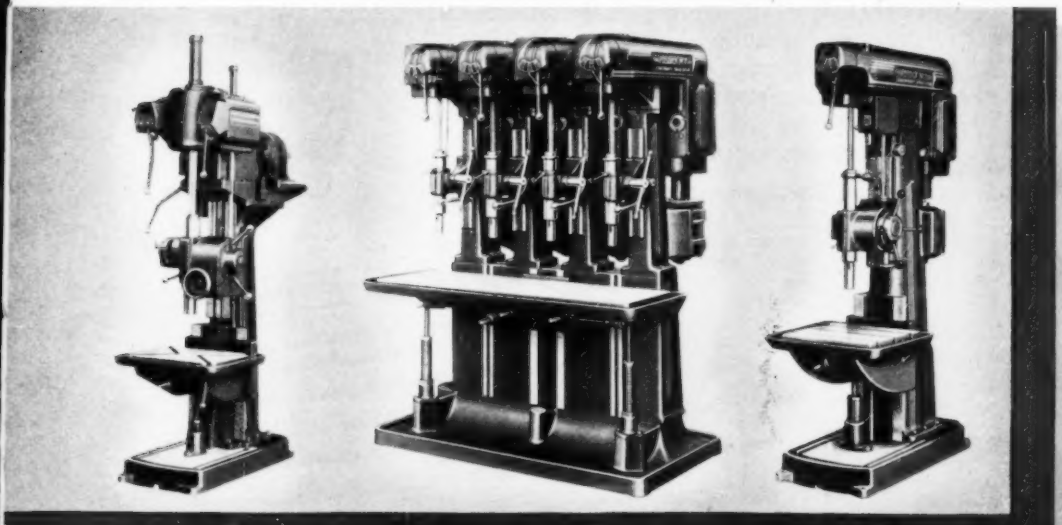
3.

Presents a modern line of *MACHINE TOOLS . . . .*

● Included in this modern line of Fosdick Machine tools are machines for drilling—reaming—boring—facing and similar operations. Fosdick Jig Borers have gained wide acceptance for precision operations, in tool rooms and tool and die shops. Hydraulic Radial Drills are available in types and sizes to meet your most exacting requirements. The new Sensitive Radials, which combine the advantages of both the Sensitive and Radial Drills, provide a high speed sensitive machine for radial work.

Also included in this line are Sensitive Drills in single and multiple spindles up to six. For high production a single purpose Sensitive with one speed and one feed has been added. Standard Sensitive Drills are equipped with six or nine speeds. Medium and heavy duty Upright Drills are obtainable in both box and round column types. Special production features can be added to any one of the Fosdick Machines.

Consult a Fosdick Representative or write for bulletin for detailed information.



4. 5. 6.

THE *Fosdick* MACHINE TOOL COMPANY
CINCINNATI 23, OHIO

ARMSTRONG

ARMALOY

Drop Forged

WRENCHES

ARMSTRONG ARMALOY — Wrenches are NEW. They are designed to meet the requirements of the mechanic who knows his tools and insists on using tools of Superior Quality.

ARMSTRONG ARMALOY — Wrenches are made from selected grade alloy steel. They are longer, lighter, thinner, yet stronger than the conventional alloy wrenches—heat treated to exact specifications of stiffness and tensile strength—better balanced, hence easier to use. Finished in chrome plate with heads buffed bright.

Armstrong Tools are stocked by leading tool departments.

ARMSTRONG BROS. TOOL CO.

"The Tool Holder People."

5215 W. Armstrong Ave. Chicago 30, Ill.

If you're making heavy duty gears, shafts and pinions for planes, trucks, buses and industrial machinery

Cut your Costs with U·S·S SUPERKORE *steels*

U·S·S SUPERKORE Steels meet a long-felt need. For here is a new series of improved carburizing steels which, although they cost *less* than more highly alloyed carburizing steels, show equal or greater hardenability—are easier to anneal—have improved carburizing characteristics—possess substantially improved machinability.

U·S·S SUPERKORE Steels were developed with two objectives in mind. To reduce your raw material and manufacturing costs. To equal or improve your product performance. They will do both.

U·S·S SUPERKORE Steels are now available in four different grades—each designed for a special type of heavy duty service. That's why it is important that they be properly selected and applied.

To help you get the full benefit of these steels in improving your product and reducing its cost, the cooperation of our service metallurgists — who developed U·S·S SUPERKORE Steels—is available. They will gladly help you in putting them to work, where, and *only where*, they should be used. They will show you how to iron out any application problems involved in their use.

The new "SUPERKORE Booklet" will give you further interesting information on these steels. For your copy write direct to Carnegie-Illinois Steel Corporation, Carnegie Building, Room 2008, Pittsburgh 30, Pennsylvania.

Here's where U·S·S SUPERKORE Steels can be used to advantage

Representative Applications	Present Steel	Recommended U·S·S SuperKore Alternate
Aircraft gears, shafts, pinions, etc.	E-3310, E-9310 or equivalent AMS Specification	U·S·S SuperKore A
Heavy duty truck and tractor gears, shafts, pinions, etc.	3316, 9316	U·S·S SuperKore AA
Heavily loaded gears, shafts, pinions etc. and carburized parts used in oil well drilling industry.	4815, 4820	U·S·S SuperKore B
Gears, shafts, pinions, etc.	4317, 4320	U·S·S SuperKore C

U·S·S Carilloy Steels

ELECTRIC FURNACE OR OPEN HEARTH
COMPLETE PRODUCTION FACILITIES
IN CHICAGO AND PITTSBURGH

CARNEGIE-ILLINOIS STEEL CORPORATION

Pittsburgh and Chicago

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
Tennessee Coal, Iron & Railroad Company, Birmingham, *Southern Distributors*
United States Steel Supply Company, *Warehouse Distributors—Coast to coast*
United States Steel Export Company, New York

8-382

USS STEEL

UNITED STATES STEEL

For the First Time!

Electronic on

ELECTRALIGN

Exclusive New Brown & Sharpe Development

Here is a unique aid that permits grinding machine operators to accurately align a swivel table for straight or tapered work after only *one* preliminary grind. ELECTRALIGN, designed to transfer operator's skill to a function of the machine, eliminates costly time-consuming, cut-and-try operations. It does much to eliminate spoiled work, particularly where only .002" to .003" is left for finish grinding.

This exclusive arrangement for Brown & Sharpe Cylindrical Grinding Machines uses a highly-sensitive strain gage to detect swivel table movement and employs an electronic amplifier to magnify movements to large scale readings. Displacements of .0001" are easily detected. Deflections are direct reading . . . no interpolation or transposition of figures needed.

The following Brown & Sharpe Grinding Machines are obtainable with ELECTRALIGN: Nos. 1, 2, 3 and 4 Universal—Nos. 5, 10, 12, 20, 22 and 23 Plain—No. 13 Universal and Tool. For complete details, write Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

BROWN &

Alignment of Swivel Table Grinding Machines

ACCURATE SETTING EASILY MADE

The extreme simplicity and reliability in operation of the ELECTRALIGN makes it very practical for shop use. Corrections in swivel table alignment may be made simply and precisely. No need of regrinding several test pieces to obtain proper adjustment.

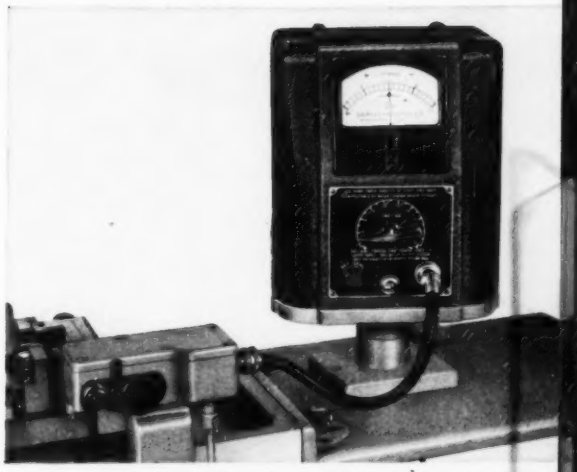
SET-UP TIME SHARPLY REDUCED

After ELECTRALIGN amplifier pointer has been set to the ten-thousandths desired to swing the work, the operator makes a single, positive correction by moving the table, through its regular adjusting mechanism, until the pointer reads zero. It's done in an instant! This correction can be made during the grinding operation.

EASIER OPERATION FASTER PRODUCTION

On long work ground to close limits, even a slight taper may represent a large part of the allowable tolerance. On this type of work, ELECTRALIGN makes setups easier and more positive . . . makes faster production possible . . . and reduces risk of spoilage. Tapers, too, can be set directly after one preliminary grind . . . and precise settings maintained.

OTHER PRACTICAL ADVANTAGES — ***ELECTRALIGN*** may be supplemented by the Electralign-Comparator Selector when external or internal measurements employing a comparator are made in conjunction with setting the table for alignment. This equipment eliminates differences in measurement due to human "touch or feel" and a wide choice of comparators is possible.



Conveniently located Electralign Amplifier magnifies small angular swivel table movements to large scale readings.

Operator using Electralign-Comparator Selector with a special gage to check measurement of straight work. A wide variety of comparators may be adapted for use with this equipment.

SHARPE B·S

Cut YOUR LABOR *Costs*

with high-production

GARDNER *Double* GRINDING

WORK DATA

Part: *Button Dies*
Material: *Steel*
Operation: *Grind Two Sides*
Tolerances: *.0005" to .0015" for Parallelism: .002" to .004" for Uniformity*
Stock Removal: *.006" Maximum Overall*
Production: *15 to 25 Pieces per Minute*
Feed: *Hand Load to Trough-type Feeder: Automatic Unload*
Machine: *No. 114-20" Gardner Double Grinder*

HIGH production machines enable you to lower your cost-per-unit — through cutting down labor costs. And when those high production machines maintain close accuracies, they also help eliminate the cost of "rejects" and wasted materials.

The GARDNER No. 114-20" Double GRINDER, shown above, speeds up production on steel button dies by grinding TWO sides, to close tolerances, with ONE pass between the opposed grinding wheels.

Regardless of the size or type of parallel-surfacing operations in your plant, GARDNER Double GRINDING will help cut labor costs, maintain closer accuracies and boost production volume.

Write for New Bulletin on GARDNER *Double* GRINDING!

GARDNER-GRIND YOUR *Flat* SURFACES

GARDNER MACHINE COMPANY

410 East Gardner Street • • • • Beloit, Wisconsin, U.S.A.

Get Action LIKE THIS:

★ **24 hours to make and install coils in 250 HP motor**

★ **Rebuilt 250 HP slip ring motor in 2½ days**

★ **3 days to rebuild 125 HP motor including 200 miles of truck shipment**

THESE ARE ACTUAL JOBS turned out by Giles Armature and Electric Works, Marion, Illinois . . . the kind A-C Certified Service Shops are doing every day!

When every hour costs money . . . when production is stopped . . . Allis-Chalmers Certified Service on motors, transformers, pumps, etc., can get you rolling again, *fast*. Dependable for prompt service on routine work, too.

Call Your A-C Office or Dealer. A-C Certified Service Shops are hand-picked, independent repair shops meeting rigid standards for equipment, trained personnel and business reputation for square dealing. For the one nearest you, ask your Allis-Chalmers Dealer or District Office.

Check with us for *new* motors too. Stock or quick delivery on many sizes, types.

Texrope and *Vari-Pitch* are Allis-Chalmers trademarks. A 2594

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MILWAUKEE, WIS.

ALLIS-CHALMERS

Sold . . .
Applied . . .
Serviced . . .

by Allis-Chalmers Authorized Dealers, Certified Service Shops and District Offices throughout the country.

MOTORS — ½ to 25,000 HP and up. Matching Allis-Chalmers Control.

TEXROPE — Belts in all sizes and sections, standard and Vari-Pitch sheaves, speed changers.

PUMPS — Integral motor and coupled types. Sizes and ratings to 2500 GPM.

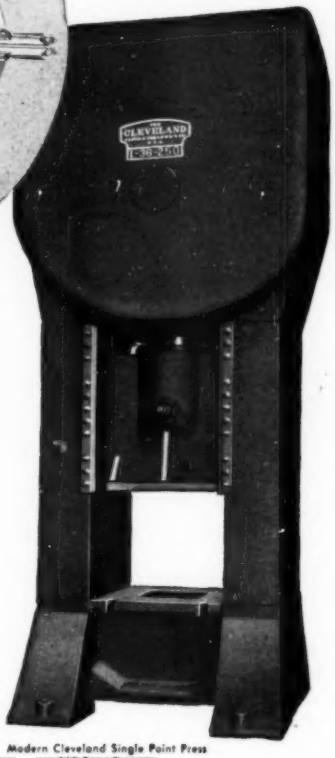
CLEVELAND

(PATENTED) DRUM TYPE FRICTION CLUTCH AND BRAKE GIVES YOU THE UTMOST ECONOMY OF OPERATION THROUGH:

★ ***GREATER EFFICIENCY***
★ ***LESS DOWN TIME***
★ ***LIGHTER WEIGHT***
★ ***FEWER PARTS***

Always Full Clutch or Full Brake

Modern Cleveland Two Point Press
350 Tons Capacity



Modern Cleveland Single Point Press
250 Tons Capacity

AVOID production delays—be sure to investigate this CLEVELAND DRUM TYPE CLUTCH—acclaimed as one of the most outstanding contributions to uninterrupted production yet developed for Presses.

This new CLEVELAND DRUM TYPE CLUTCH may be obtained on all new Cleveland Presses and can also be applied to your present equipment. We will be pleased to furnish you with our new Catalog, plus any special information you may need.

Address inquiries to Dept. 3 A.M

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U.S.A.
Established 1880

PUNCHING TOOLS & DIES
OFFICES AT
NEW YORK . . . . CHICAGO
DETROIT . . . . PHILADELPHIA
PITTSBURGH

FABRICATING TOOLS
CLEVELAND 14, OHIO

POWER PRESSES

131% DIVIDEND

IN ONE YEAR*

The Messinger Mfg. Co., Tatamy, Pa., makers of Insecticide Dusters, Threshers, Corn-Shellers and Woodworking Machinery are reaping the benefits of Turret Lathe Productivity.

131% of the funds invested in Jones & Lamson Turret Lathes were repaid to the purchaser in one year of operation.

* Both large and small lot production of sheaves, bearing caps, blowers, blower cases, worm gear housings, etc., are now turned at peak economy on Jones & Lamson Universal Turret Lathes. One year's savings, based on direct costs alone, more than paid for three machines complete with equipment!

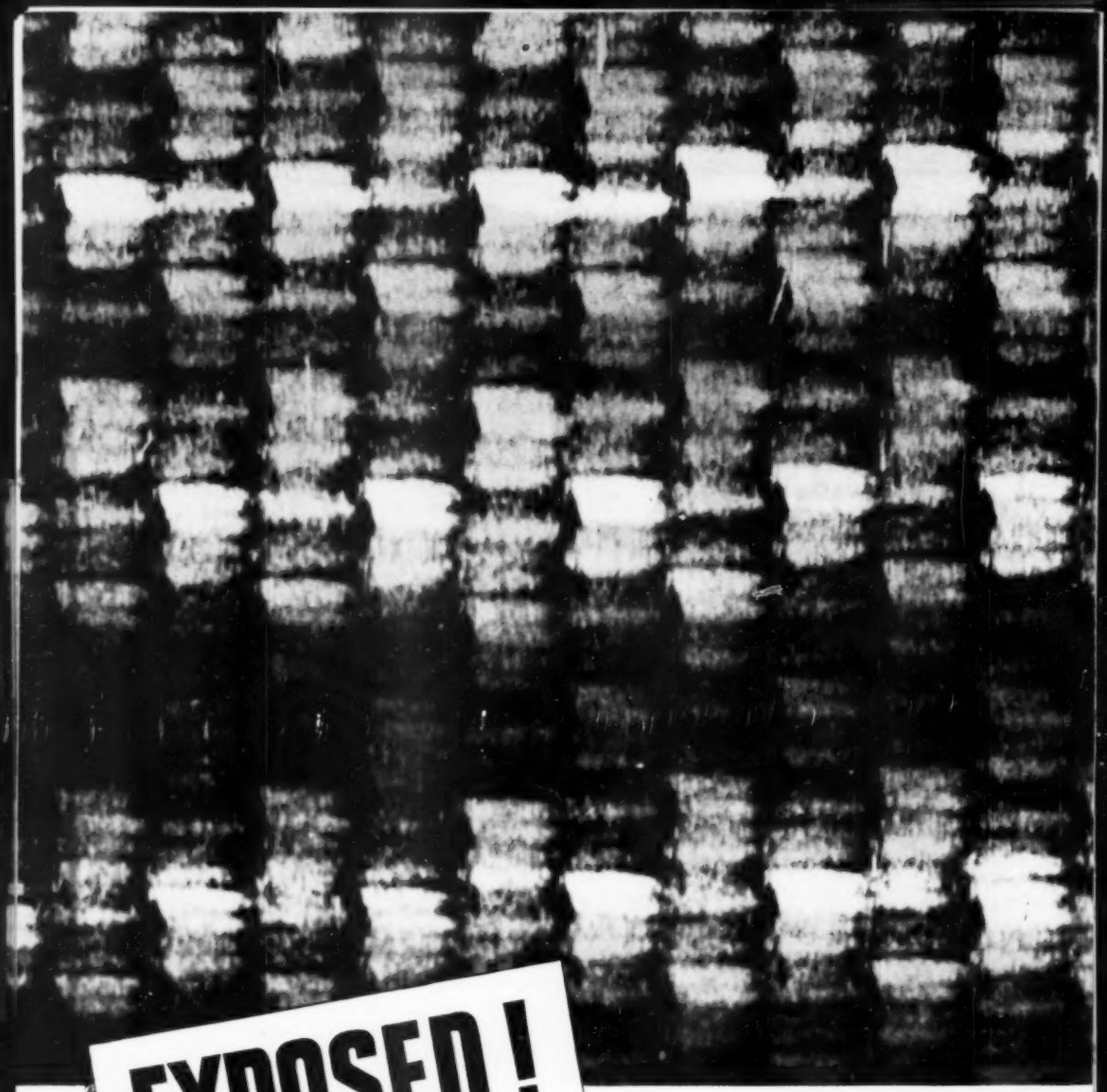
Messinger Mfg. Co., famous for over 90 years' experience in producing agricultural implements, reports that six obsolete lathes were replaced – with capacity to spare. Savings were due to carbide tooling, to the elimination of second operation arbor work (accurate bored jaws were faster and easier) and to the ability of the new machines to hold and repeat exact size settings by means of multiple stops.

Even if your present machines are less than 10 years old, the purchase of a new Jones & Lamson Turret Lathe may be justified through *direct savings alone!* Let us determine YOUR possible savings. **Write to Dept. 710H for this free service.**

Turret Lathe Division

JONES & LAMSON MACHINE COMPANY
Springfield, Vermont, U.S.A.

MACHINE TOOL CRAFTSMEN SINCE 1835



EXPOSED!

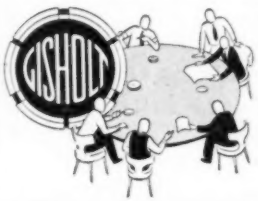
by SUPERFINISH

Here, in an enlargement of a 3/4" section, you see the grinding defects —*chatter and feed marks*—left on a ground surface which was previously considered acceptable. Partial Superfinishing shows them up. Complete Superfinishing will remove them . . . and produce a bearing surface which will last infinitely longer.

Superfinishing is a quick and inexpensive process which more than pays for itself in better performance, longer life and reduced service problems. The booklet, "Wear and Surface Finish," will be sent upon request. Please use your company letterhead.

GISHOLT MACHINE COMPANY

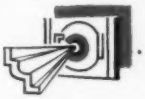
Madison 10, Wisconsin



THE GISHOLT ROUND TABLE represents the collective experience of specialists in machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

TURRET LATHES • AUTOMATIC LATHES • BALANCERS • SUPERFINISHERS • SPECIAL MACHINES

DOGHOUSE!

A designer . . . plagued with production costs of a fluorescent reflector housing . . . solved the double problem of lightness and strength plus fast manufacture. He hadn't considered the economy of finished parts by extrusion  . . . had kept magnesium in the doghouse.

But he asked Aluminum Company of America, light metal headquarters, for help. He found that fellow manufacturers every month are using over a million pounds of magnesium. He found that magnesium machines fast, and has a high strength-weight ratio . . . . that common sense shop practice makes handling magnesium no problem.* He got technical advice and books about designing and fabricating magnesium. Now, instead of fabricating parts like this, he buys immediately available Magnesium Extrusions like this. His production time is slashed. His lighter, stronger reflector housing is outselling competition.

*No change in insurance rates.

These two, free books on magnesium and our broad technical experience can help your products, too. Write Aluminum Company of America, sales agent for American Magnesium products, 2107 Gulf Building, Pittsburgh 19, Pennsylvania.

MAGNESIUM MAZLO® PRODUCTS

AMERICAN MAGNESIUM CORPORATION

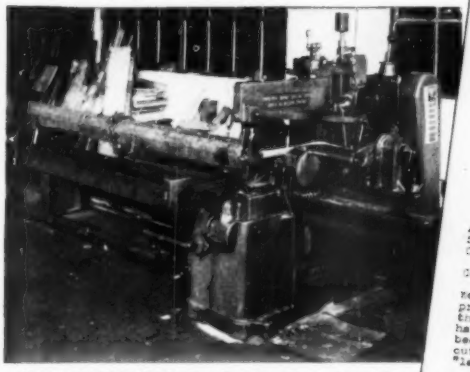
SUBSIDIARY OF ALUMINUM COMPANY OF AMERICA

WHICH IS BETTER FOR YOU, HACK SAWS OR BAND SAWS ?

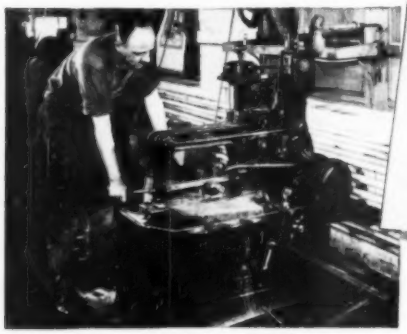
Reading Chain & Block Corporation found the answer by contacting the MARVEL field engineer. Only a MARVEL engineer could analyze this problem without bias because only MARVEL makes both hack saws and band saws. As a result, Reading bought three different types to most efficiently handle their metal sawing. A No. 6A machine for production cutting of identical pieces, a No. 4B machine for fast, accurate, miscellaneous cutting, and a No. 8 band saw machine for cutting of structurals, mitering, and other miscellaneous work.

Whatever your metal sawing problem, there is among MARVEL'S 11 different series of sawing machines, a saw or saws that will exactly meet your needs. Your local MARVEL Engineer will gladly study your sawing problems, make recommendations and quote prices.

No. 8 MARVEL Metal Cutting Band Saw. This most versatile saw takes work up to 18" x 18", mortises, miters or roughs to shape.



No. 9A MARVEL Production Saw (world's fastest) automatically feeds, measures and cuts off identical pieces from nested or single bars up to 10" x 10" cross section.



No. 4B MARVEL Hign Speed Saw is a moderate priced, very fast 6" x 6" capacity saw. Here it ideally meets the requirements of the maintenance department.

READING CHAIN and BLOCK CORPORATION

Manufacturers of Materials Handling Equipment

CHAIN HOISTS - ELECTRIC HOISTS - TRAVELING CRANES - MONORAIL SYSTEMS

GENERAL OFFICE
READING, PA., U.S.A.

October 24, 1947

Armstrong-Blum Mfg.Company
5700 West Bloomingdale Avenue
Chicago, 39, Illinois

Gentlemen:

We have in our shop three Marvel Saws which are used all day in production work for the cutting of materials in connection with the manufacture of hoists and cranes. Since these three saws have been used in our plant the cost of cutting materials has been greatly reduced, and the speed at which the materials are cut has been increased to such a point that we no longer have "lay overs" due to the lack of materials.

We wish to assure you at this time that when we need more automatic saws in our plant, we will definitely give you first consideration to install the Marvel Saws in our plant.

Whenever it has been necessary for any repair service, or engineering service, to be applied to these saws, we have never had to wait or inquire the second time for these services. That is one thing that has kept us in production to this date.

Again assuring you that your services and attentions to our requirements have been very satisfactory, we remain,

Very truly yours,

READING CHAIN & BLOCK CORP.

Fred M. Howard

Fred M. Howard
Purchasing Agent

F Hrakh

MARVEL Metal Cutting SAWS
Better Machines - Better Metals

ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"

5700 Bloomingdale Ave. Chicago 39, U. S. A

Investing in More Produc[illegible]

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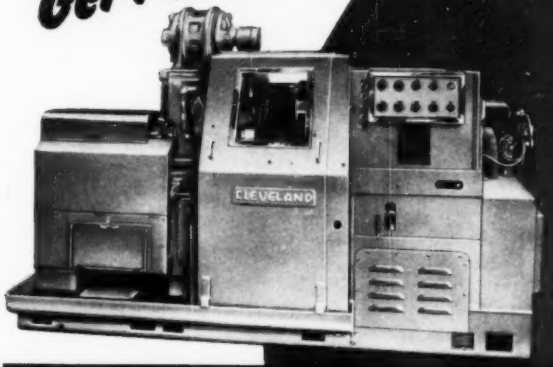


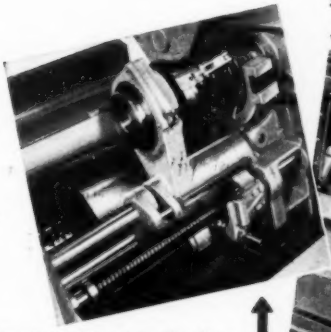
Model AB 2½" Single Spindle Automatic

Design and Construction Features

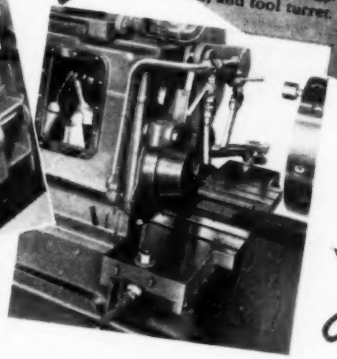
The new Model AB *Dialmatic* Cleveland sets the pace in single spindle automatic screw machine design. Listed below are the principal construction highlights. Some are time-tested features which have made Cleveland the leader in its field for nearly 60 years—others are highly advanced improvements. All combine to greatly increase the speed of set-up and flexibility of control vital for higher production at lower cost.

- Universal camming
- Infinitely variable electric tool feed drive
- High speed index independent of tool feed
- Four automatic spindle speeds
- 112 speed selections from 24 to 1820 rpm.
- Hand crank stock feed adjustment
- Timken bearing equipped spindle
- Draw-in type chucking
- Geared anti-friction spindle head
- Five hole turret
- Double cross slides
- Oil feed through turret
- Pump driven lubricating system
- Coolant system with pump drive
- Convertible to a chucker
- Independent cut-off

Electric panel showing feed calculating chart and separate dials for controlling forward and return feed for each turret position.



Stock feed hand crank adjustment and latch construction for holding feed tube assembly.



Spindle head, cross slides, independent cut-off, and tool turret.

Write now for complete information

Remember,

Cleveland's Cut Costs

THE CLEVELAND AUTOMATIC MACHINE COMPANY

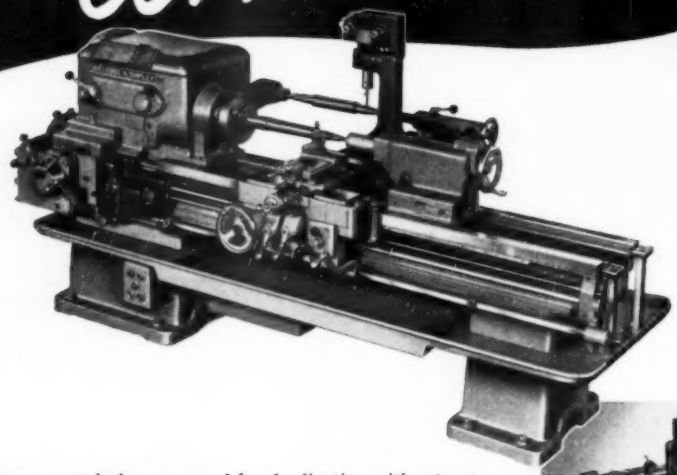
4928 Beech Street
Cincinnati 12, Ohio

SALES OFFICES: CHICAGO
CLEVELAND • DETROIT
HARTFORD • NEWARK

Manufacturers of a Complete Line of Single Spindle Automatic Screw Machines and High Pressure Hydraulic Die Casting Machines

NOW INSTANT CHANGE-OVER for DUPLICATING or REGULAR WORK . . .

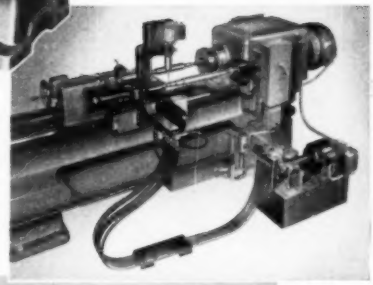
on the new LODGE & SHIPLEY COPYMATIC!



NO longer must lathes arranged for duplicating with a tracer controlled device be *special purpose machines!* The Lodge & Shipley COPYMATIC is a dual-purpose machine . . . can be used for COPYMATIC work or regular lathe work without limiting the range of either. It takes but a minute to change the set-up . . . there is nothing to take off or put on.

In Duplicating work, the COPYMATIC uses either round or flat templates. The first piece in the lot can be machined in the regular way and then used as a template for duplicating the balance of the lot. Exclusive design features permit the facing of sharp shoulders to extremely close limits.

Applied to the Lodge & Shipley Model "X" line of 16 inch and 20 inch Lathes, the COPYMATIC is a combination of the finest lathe and modern automatic tracer duplicator. Ask your Lodge & Shipley Representative for additional details or write for new Bulletin No. 675.



Illustrations, from top to bottom: The COPYMATIC's all-hydraulic tracer head; 16" COPYMATIC Lathe; rear view of hydraulic control unit; and a few samples of multiple diameter shafts with sharp shoulder faces, grinding necks, tapers in both directions, chamfers and curved contours.

THE Lodge & Shipley COMPANY

MACHINE TOOL DIVISION • 3055 COLERAIN
SPECIAL PRODUCTS DIVISION • 800 EVANS ST.
CINCINNATI 25, OHIO

* How to raise gears to live and work together

HERE'S A PAIR of twins and a set of "quads" born and raised to live long and work well as a team. They come from a long-lived family of products that has earned a reputation for staying on the job. "Double Diamond" is the name.

No one factor is responsible for this. Rather it is the hard day-to-day job of holding to one set of standards in *all* manufacturing processes. Each individual Double Diamond employee knows that his job is just as important as any other to the performance of the final product. That's our idea of the way to make gears. And if gear performance has a bearing on the performance of your products, on the integrity of your trade mark, we'd like to do business with you.

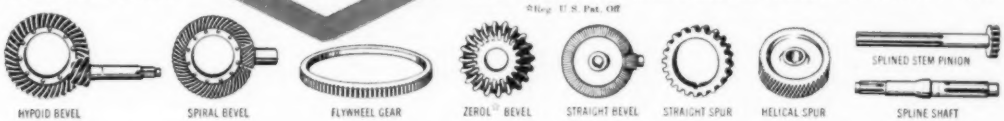
A letter or phone call will place our engineering department at your service.

DOUBLE DIAMOND
TRADE MARK
GEARS

Made by
Automotive Gear Works, Inc.
RICHMOND, INDIANA

• • • • FOR AUTOMOTIVE FARM EQUIPMENT AND GENERAL INDUSTRIAL APPLICATIONS • • • • •

*Reg. U.S. Pat. Off.



TWO GREAT NAMES...DODGE-TIMKEN!

It was Dodge who took the famous Timken Bearing, mounted it, sealed it, housed it and delivered a pillow block of new high quality—fully assembled, ready to lock on the shaft and carry the power loads of industry with new efficiency.

Dodge develops *outstanding* power transmission products, as proved by the big success of Dodge-Timken Bearings on millions of industry's toughest jobs.

Dodge-Timken Bearings are supplied promptly from stock in four basic types and a wide range of sizes to meet an almost limitless variety of anti-friction problems.

Dodge also produces Ball Bearing Pillow Blocks which, with Dodge-Timken Bearings, comprise the famous "30,000 hour line." Write for complete bulletins.

DODGE MANUFACTURING CORPORATION
Mishawaka, Indiana

DODGE

of Mishawaka, Ind.

CALL THE TRANSMISSIONEER

He is your local Dodge Distributor—factory trained—qualified to suggest ways to improve your machine performance, increase production. Look for his name under "Power Transmission Equipment" in your classified phone book.

Copyright, 1949, Dodge Mfg. Corp.

NAME PLATES

FOR YOUR NAME PLATE REQUIREMENTS, WRITE OUR SUBSIDIARY,
ETCHING COMPANY OF AMERICA, 1520 MONTANA STREET, CHICAGO 14, ILLINOIS

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Presents America's Newest and Finest

16 GAGE FOOT SHEAR

Featuring

- Capacity greater than ever before
- Welded steel strength and rigidity
- Formed steel throughout
- Automatic holddown
- Heavy duty bronze ways
- Clean straight cuts
- Easy operation — lively action
- Portable
- 30, 36 and 42" cutting lengths

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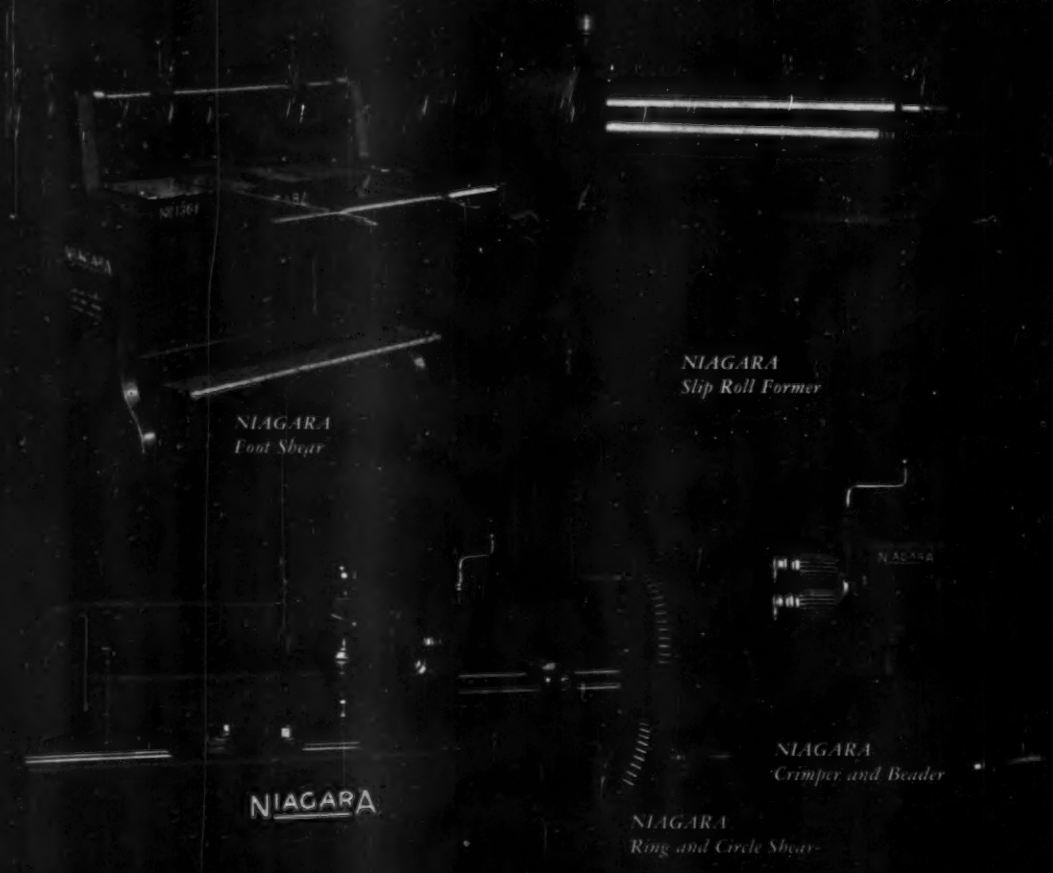
America's Most Complete Line of

MACHINES AND TINNERS' TOOLS

FOR PLATE AND SHEET METAL WORK



NIAGARA
Foot Shear

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Slip Roll Former

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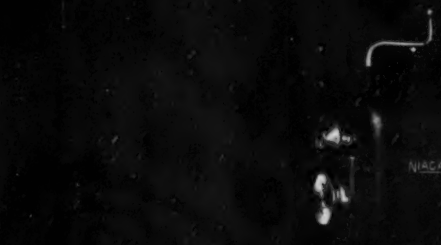
Crimper and Beader

NIAGARA
Ring and Circle Shear

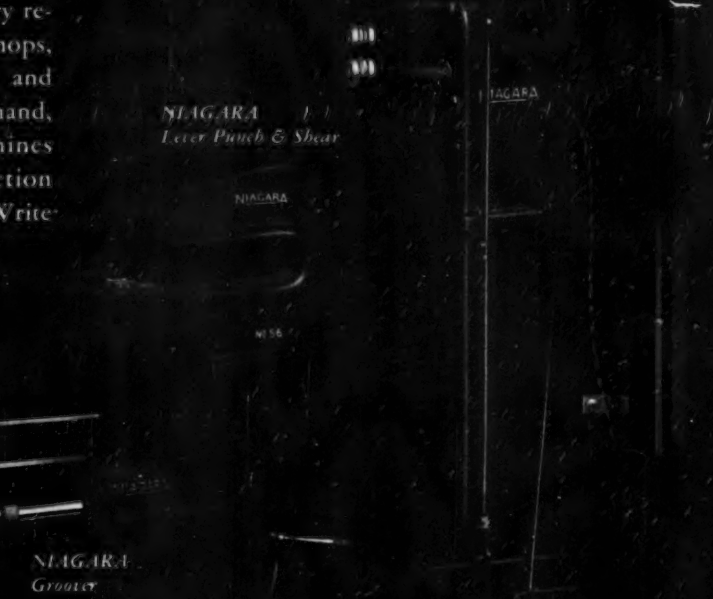
NIAGARA MACHINE & TOOL WORKS, BUFFALO 11, NEW YORK

RA

The tinners tools and machines shown on these pages are just a few of the hundreds included in the complete Niagara line. There is an economical, productive and reliable press, shear, machine and tinners' tool for every requirement for sheet metal job shops, plant maintenance departments and high production plants. Niagara hand, foot and power operated machines offer low first cost, low production cost and low maintenance cost. Write for catalogs.



NIAGARA
Combination
Bench Machine



NIAGARA
Lever Punch & Shear

NIAGARA
Groover

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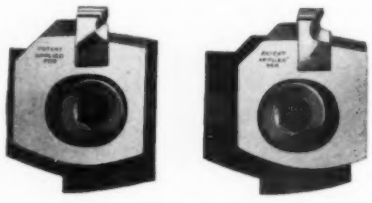
NIAGARA
Electric Combination
Machine

DISTRICT OFFICES — NEW YORK • CLEVELAND • DETROIT

Adjustable Blade Chasers



New chaser, with holder offset to left; cutting edge up to proper working position.

Reground chaser, with holder offset to right to compensate for wear; cutting edge still up to proper position.

4 OUTSTANDING ADVANTAGES

1. Only available adjustable-for-wear-blade chasers (with provision for diametric adjustment).
2. Same accurate chaser grind checking (with Namco Micro-Gage).
3. Carbide turning blades—regardless of whether run is long or short.
4. Because the helix is on the chaser itself, a minimum of die slides and chaser holders are required.

FOR THE NAMCO STYLE DBS

VERS-O-TOOLS

For Brown & Sharpe Automatics

Here is an entirely new product. Nothing like it has ever been offered before, by any manufacturer.

For the first time, the proved advantages of adjustable blade chasers are available to users of Brown & Sharpe Automatics. The same Namco Style DBS Vers-O-Tool, already famous with circular chasers, will further cut your threading costs by the use of the lower-priced Namco adjustable blade chasers for medium and short-range lots.

An exclusive design feature of the adjustable blade chaser is the provision for take-up of block after each grind. Chasers are always up to proper cutting position.

With this unbeatable combination you have the latest in 1949 threading equipment—to meet the tougher price competition of 1949 markets. May we quote costs on this important modernizing step for your machines?

Adjustable-for-wear-Blade Type Chasers are also used in Namco DR & DS Vers-O-Tools and are interchangeable—die size for die size.

The NATIONAL ACME CO.

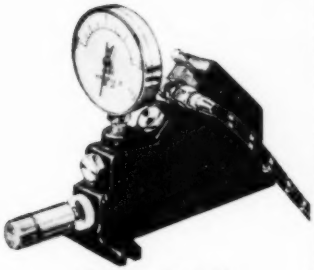
170 EAST 131st STREET • CLEVELAND 8, OHIO

Acme-Gridley 4-6 and 8 Spindle Bar and Chucking Automatics • Single Spindle Automatics • Hydraulic Thread Rolling Machines • Automatic Threading Dies and Taps • The Chronolog • Limit, Motor Starter and Control Station Switches • Solenoids Centrifuges • Contract Manufacturing

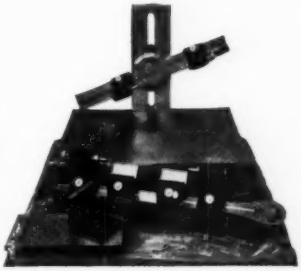
Look to Merz

for precision equipment for every inspection need!

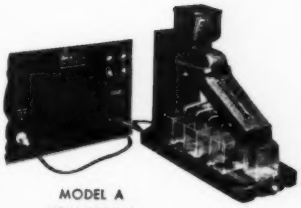
EXACTITUDE
STANDARD A.G.D. GAGES



VERSATILE—MODEL 30
NEW-MATIC MEASURING MACHINE



MASTER MODEL
UNIVERSAL CHECKING PLATE



MODEL A
NEW-TRONIC
BALL SORTER

MODEL A-10
NEW-TRONIC
COMPARATOR

MODEL B-10
NEW-TRONIC HEIGHT GAGE

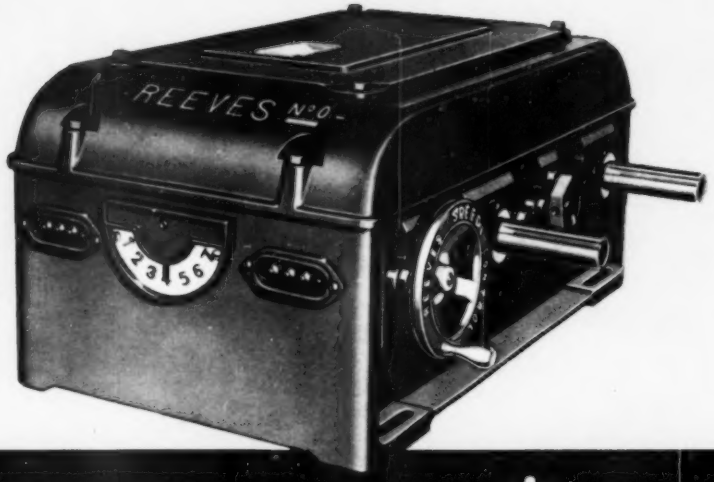
VIGILANT—MODEL 60
NEW-MATIC
MEASURING MACHINE

Whatever your inspection requirements, look with complete confidence to Merz precision measuring and checking machines. Every Merz product is a proved cost-cutter, a tested time-saver. The Merz line includes *New-Matic* Measuring Machines, *New-Tronic* Comparators and Gages, Checking Plates, Standard A.G.D. Gages. Merz also specializes in the custom-building of equipment for handling unusual inspection and sorting problems, however complex. Merz inspection equipment has for years been helping to reduce loss, speed production and increase profits for many of the nation's leading industries. Write for complete information on how Merz' "Four Spheres of Service" can do the same for you.

MERZ ENGINEERING COMPANY • INDIANAPOLIS 7, INDIANA

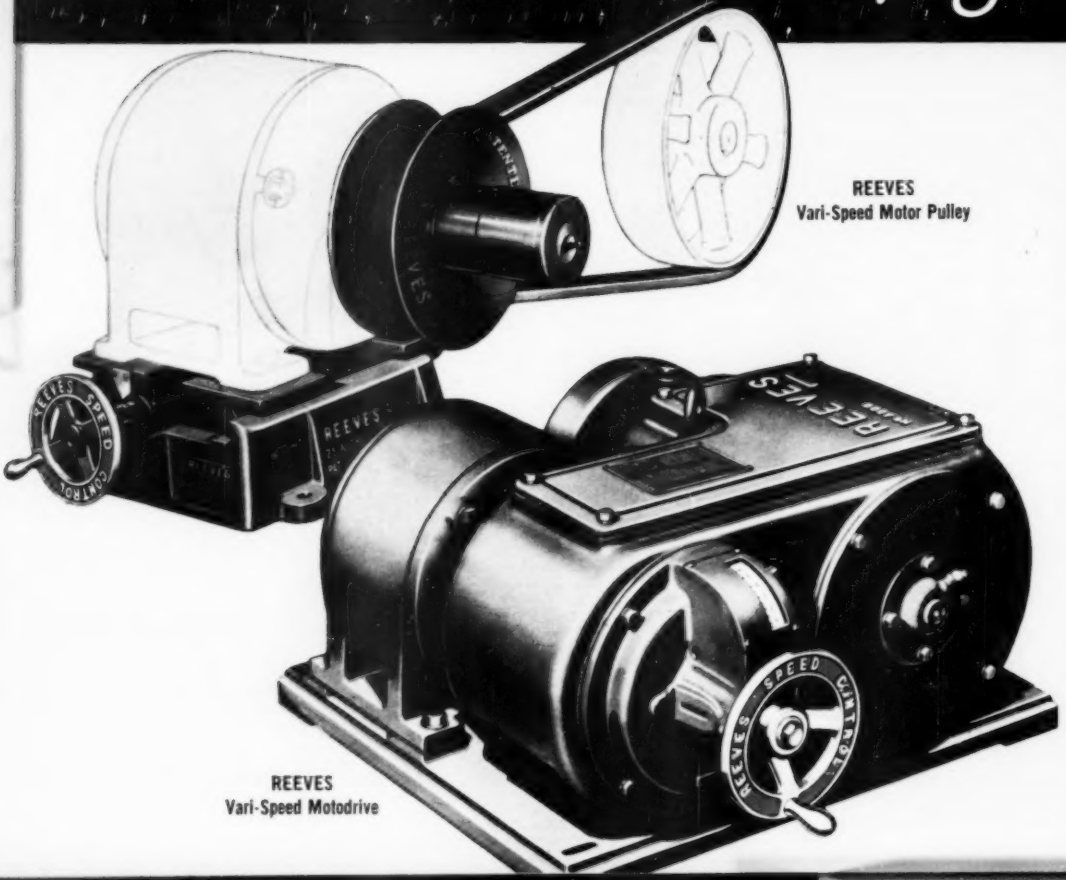
MERZ

The House That Precision Built



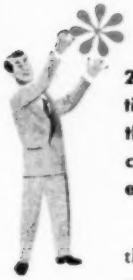
REEVES
Variable Speed Transmission

Listen! to what they're saying



REEVES
Vari-Speed Motor Pulley

REEVES
Vari-Speed Motodrive



By "They" we mean the 25,000 industries in which there are 265,000 successful REEVES installations . . . and the manufacturers of the 2,100 different makes of machines on which REEVES is standard equipment.

No two of these manufacturers have the same speed control problems. No two of them use REEVES in exactly the same way. Yet, *every one* of them agrees that REEVES cuts unit costs . . . increases production . . . improves quality of product!

Applied to your machines, REEVES Speed Control can give these same end results by performing one or more of these eight vital functions:

5 Maintain Uniform Peripheral Speed . . . maintain absolutely uniform tension on a decreasing or increasing diameter.

6 Compensate for Changes in Consistency of Materials . . . for changing density, coagulation, viscosity or congealing of material in process.

7 Match Variances in Number or Skills of Operators . . . provide the flexibility needed to speed up or slow down accurately and conveniently to meet changes in number of operators and to match the differences in skill of operators.

about Reeves Speed Control!

1 Assure Accurate Timing . . . provide maximum speed flexibility . . . insure exactness in heating, baking, drying, cooking, cooling or chilling time.

2 Compensate for Variable Weights, Pressures, Etc. . . . make possible, through automatic operation, instant speed changes to maintain uniform pressure weight, liquid level, temperature.

3 Widen the Work Range of Machines . . . permit handling of more shapes, sizes and materials on the *same* machine.

4 Regulate Conveyor Speeds . . . provide the desired speed without interrupting production flow . . . prevent delays, lost motion, congestion or idleness caused by over-supply at certain points and under-supply at others.

8 Synchronize Parts of One Machine or Machines Operating in a Series . . . permit a continuous flow of materials to run directly from one processing machine to another machine or from one section of a machine to another section . . . cut down material waste and insure higher quality, more uniform products.

REEVES maintains a nation-wide organization of experienced speed control engineers to aid in solving *your* speed control problems. The REEVES representative nearest your plant is always ready to counsel with you on your speed control needs—at no obligation. Write for his name, and for free, 114-page REEVES Catalog No. A19-450A.

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Columbus, Indiana

Recognized Leader in the Specialized Field of Speed Control Engineering

ACCURATE • VARIABLE
Reeves Speed Control
GIVES THE RIGHT SPEED FOR EVERY JOB!

BUILDING BETTER TOOLS SINCE 1906

Send Coupon at once for the catalog(s) you want — or contact our local distributor. You will find his name under "Machinery" or "Machine Tools" in your classified telephone directory.

SOUTH BEND LATHE WORKS
419 East Madison Street, South Bend 22, Indiana

Please send the catalog(s) checked:

☐ Catalog 100-G ☐ Catalog 73 ☐ Catalog 9-F
☐ Catalog 77-U ☐ Catalog 400

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NEW SOUTH BEND LATHE CATALOGS

CATALOG 100-G describes Quick Change Gear and Toolroom Lathes with 9", 10", 13", 14½", 16" and 16/24" swings; Precision Turret Lathes with ⅝" and 1" collet capacities — 9", 10" and 16" swings; Attachments, Accessories and Tools.

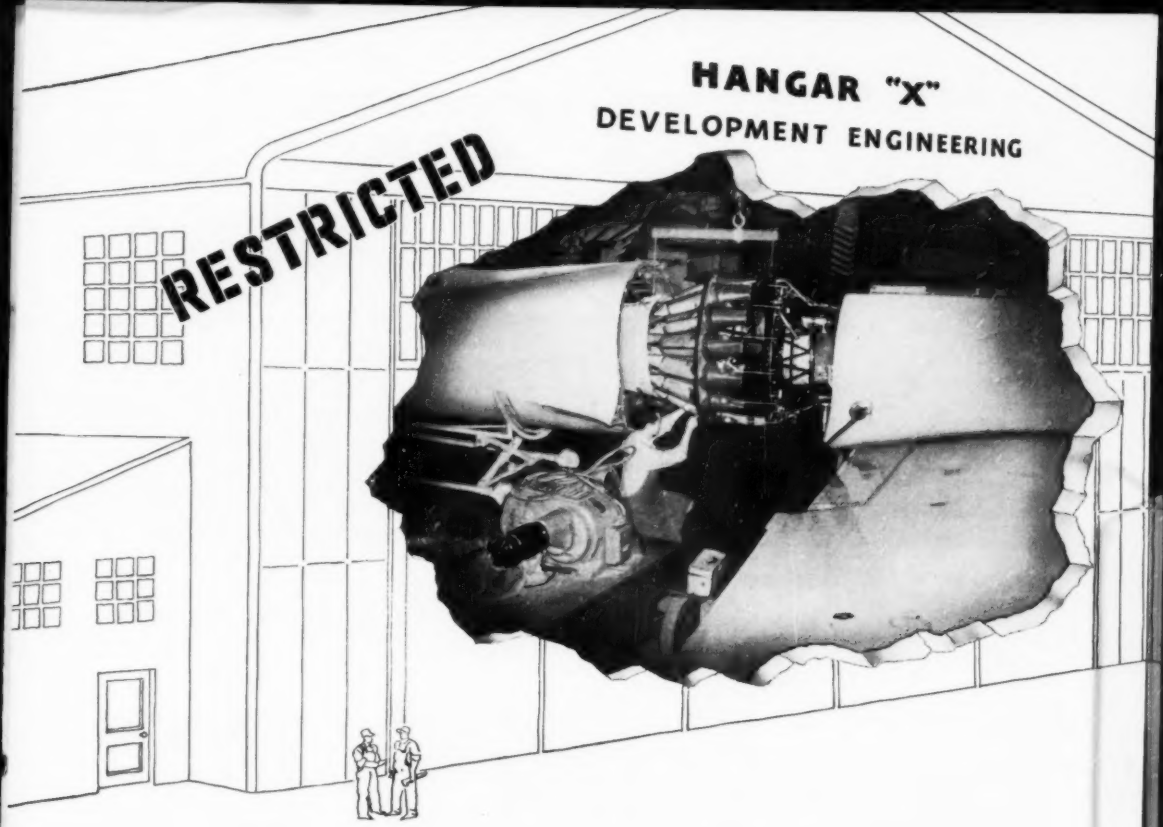
CATALOG 9-F describes Quick Change Gear, Plain Change Gear and Toolroom Lathes with 9" swing; Precision Turret Lathes with ½" collet capacity — 9" swing; Attachments, Accessories, Tools for 9" lathes.

CATALOG 73 describes the new 13" and 14½" Quick Change Gear and Toolroom Lathes with 1" collet capacity; also Attachments, Accessories and Tools that can be used with them.

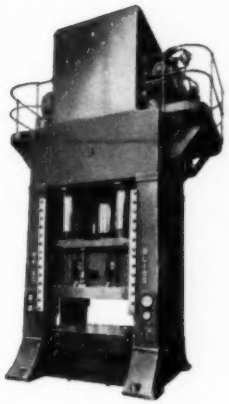
CATALOG 77-U describes Attachments, Accessories and Tools available for all sizes and types of South Bend Lathes. Many of them are readily adaptable for use with other makes of lathes.

CATALOG 400 describes the new 14" Drill Presses that are made in bench and floor models for all types of precision drilling applications.

WRITE FOR ONE TODAY!



BLISS is in this picture, too!



Special press engineering for one aircraft builder produced this 1,000-ton Bliss Hydro-Dynamic Press—a double action machine for deep drawing work.

Inside the hangar they're writing the "specs" for supersonic planes. And that includes new metals—tough austenitic steels and other alloys for parts moving at faster speeds and hotter temperatures than ever before.

That's where Bliss comes on the scene. For the aircraft industry is another of Bliss' familiar "stamping grounds." Here Bliss has always provided the pioneering plane builders with the vital means of production—the power press equipment to blank, form, squeeze and draw the hundreds of metal parts required.

Yes, if "producibility" of your aircraft design is a problem, Bliss engineers can help. They bring to every conference table a fund of metal working and development engineering experience that goes back over 90 years. They'll dare to pioneer with you in designing press equipment especially suited for the job at hand.

That's why Bliss presses predominate throughout the pressed metal field: the aircraft, automotive, railroad, electrical, and many other industries...that's why presses for the toughest jobs are *Bliss-built*...that's why your problem will be nearer solution by sending for a Bliss sales engineer.

E. W. BLISS COMPANY, 450 AMSTERDAM AVE., DETROIT 2, MICH.

Mechanical and Hydraulic Presses • Rolling Mills • Container Machinery

SEE OUR CATALOG IN SWEET'S FILE

BLISS BUILDS MORE TYPES AND SIZES OF PRESSES THAN ANY OTHER COMPANY IN THE WORLD

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BLISS BUILT
TOLEDO

High Temperature Lubrication... 400° F. and up!

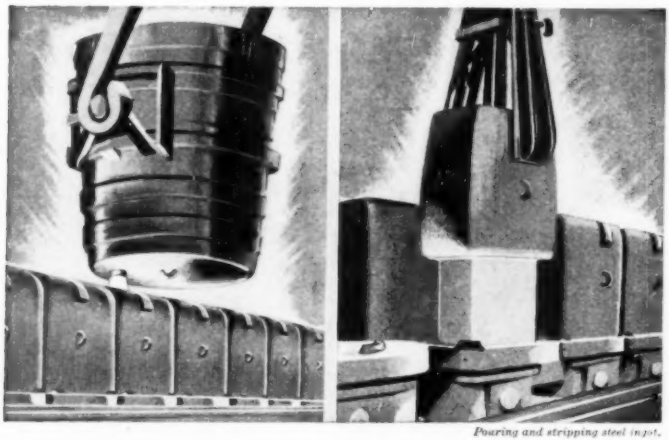
A large Midwestern steel company reports that easily applied "Darmold" Mold Wash—produced with **"dag"** colloidal graphite by the Dacar Chemical Products Company, Pittsburgh—has simplified ingot stripping...lengthened mold life...improved surface quality of ingots...reduced ingot product conditioning costs.

In the steel industry, as in countless other industries, **"dag"** colloidal graphite dispersions are continually conquering problems of high temperature lubrication. Perhaps one of the many **"dag"** colloidal graphite dispersions is the answer to your particular problem.

In addition to high temperature lubrication **"dag"** colloidal graphite dispersions are ideal for use in opaquing, parting, impregnating, general lubrication, and electronics work.

Consult Acheson Colloids engineers for possible money-saving applications of these versatile products in your business. Clip the coupon and mail NOW.

Acheson Colloids Corporation, Port Huron, Michigan; Boston; New York; Philadelphia; Pittsburgh; Cleveland; Detroit; Chicago; St. Louis; Los Angeles; San Francisco; Toronto.



Pouring and stripping steel ingot.

dag COLLOIDS
REG. U.S. PAT. OFF.

Send us information on "dag" colloidal graphite dispersions for:

Extreme (high or low) temperature lubrication ☐
General lubrication ☐ Parting ☐
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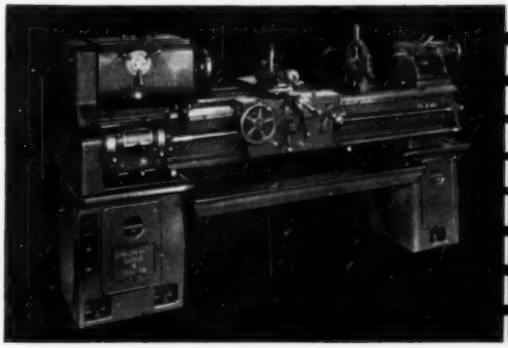
A15

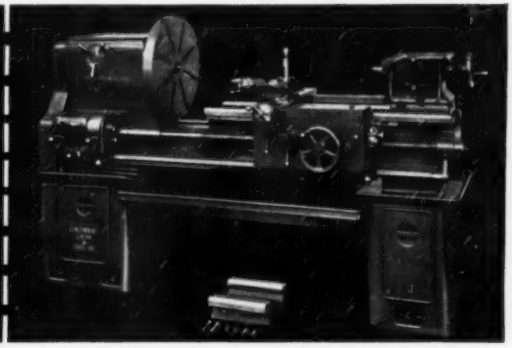
40th Anniversary Year

Acheson Colloids Corporation

Port Huron, Michigan

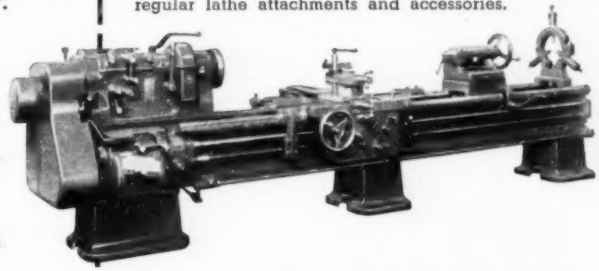
GET MORE... PAY LESS



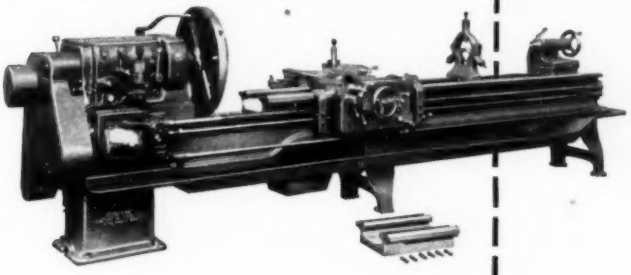


Lightweight Champ: The new Tray-Top line of light duty geared head engine lathes (10", 12½", 15", and 18" swing sizes) offers many "high price" lathe features at truly low cost: 12 spindle speeds, selected by color-coded dial; 48 thread and feed changes; exceptionally large spindles; anti-friction bearings, double-walled apron; totally enclosed quick change gear box; many others. Distance between centers from 18" to 60".

All This – And Gap, Too: 15" and 18" Tray-Tops furnished with gap, give you 22" and 25" swings over gap. Carriage has short wings on headstock end for maximum approach of tool; wings on tailstock are extended for maximum rigidity and adequate bearing surface on bed. Like regular Tray-Top, distance between centers from 18" to 60", in increments of 6". All furnished with regular lathe attachments and accessories.



Middleweight Champ: In the medium duty class, the Standard line (14", 16", 18" 20", 22", and 24" nominal swings) assures you real all-around utility with exceptionally low initial investment; quickly pays for itself by efficient handling of practically all your turning, boring, and threading operations. 12 spindle speeds; 32 thread and feed changes; distance between centers from 30" to 240".



Gaps In All 6 Sizes – Increase Capacity: With swings over gap from 24½" to 38½", Standard Fixed Gap Bed Cintilathes give you oversize work capacity where cost of heavy lathe is not justified. Versatility and economy are balanced to your requirements.

WRITE FOR BULLETINS: *T-100 on Tray-Tops; T-101 on Tray-Tops with Gap; S-100 on Standards; S-101 on Standards with Gap.*

the best buy in its class

cintilathe

CINCINNATI LATHE & TOOL CO., CINCINNATI 9, OHIO

Everything you want for PRODUCTION

HANNIFIN

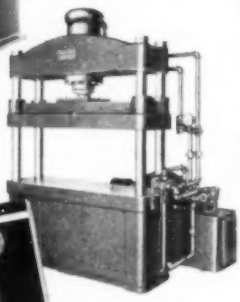
CUT production costs and boost plant output—you can do it with Hannifin "Job Tested" Hydraulic Presses! Hannifin offers standard and special types of presses for a wide variety of uses: straightening . . . press-fit assembling . . . forming . . . molding—in capacities up to 150 tons. Built in open gap and two and four column styles, complete with hydraulic power unit and all necessary gauges and controls. For detailed information and complete selection data, ask for a copy of Bulletin No. 130-X.

HYDRAULIC STRAIGHTENING PRESSES
17 standard models.

Exclusive
SENSITIVE PRESSURE CONTROL
RAM AT TOP POSITION
APPROACH STROKE AT NO PRESSURE
RAM PRESSURE INCREASES WITH LEVER OR PEDAL MOVEMENT

HYDRAULIC FORCING PRESSES
10 standard models.

HYDRAULIC COLUMN TYPE PRESSES
48 standard models.



ASK FOR A COPY OF THIS BULLETIN

CONTROLS to meet your needs

SENSITIVE PRESSURE CONTROL — An exclusive Hannifin development for straightening and forcing presses. A single lever (hand or foot operated) gives operator complete control of ram movement and pressure. Move the lever down slightly and the ram approaches work at "no pressure"... increase lever pressure, and ram pressure increases . . . release lever, and ram returns automatically to starting position.

ELECTRIC PUSH BUTTON CONTROL — For high speed repetitive operations. Engineered to fit work requirements. Wide choice of optional features, including speed control. Automatic or semi-automatic cycling, if desired.

DIRECT MANUAL CONTROL — For general utility work. Upward and downward movement of ram controlled directly by operating lever. Adjustments optional for maximum pressure and travel.

HANNIFIN CORPORATION

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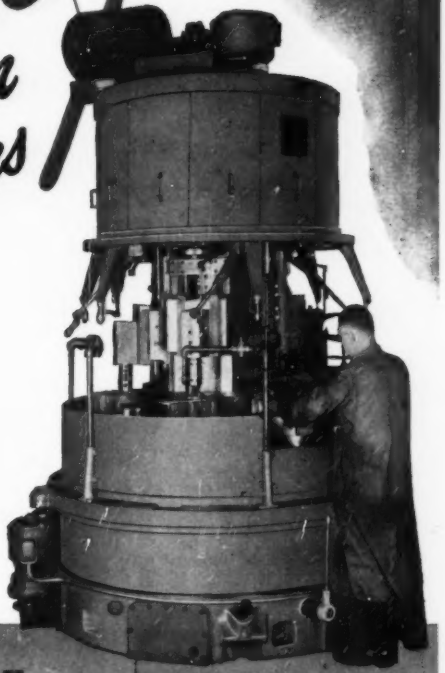
Nationwide Sales and Service

Accuracy plus economy on odd shaped pieces

. . on the Type "D" . .

BULLARD MULT-AU-MATIC

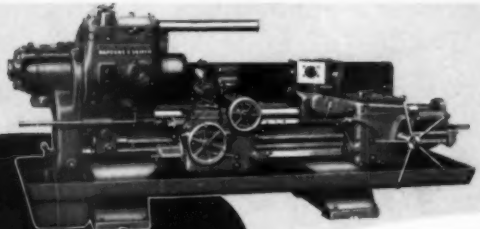


REPETITIVE ACCURACY

of Mult-Au-Matics is well known throughout the Automotive and other fields, where these machines have proven their ability to lower manufacturing costs. Here this sixteen inch six spindle, Type "D" Mult-Au-Matic is shown at work on an odd shaped piece. This is no problem, since work is chucked in a lying down position rather than hanging it up. Many other features of Mult-Au-Matics save time and lower manufacturing costs. Write for estimates on your work as applied to these machines. The Bullard Company, Bridgeport 2, Conn.

BULLARD

All in all . . . **Use Bullards for manufacturing Economies.**



Outstanding Ease of Control..

MEANS GREATER PRODUCTION from the Bardons & Oliver No. 21 Saddle Type Turret Lathe

Any speed change can be made hydraulically in an average time of two seconds. The spindle speed is preselective. Power traverse to turret saddle and cross slide carriage is easy to control and saves operating time. The hydraulic collet chuck has ample power for heaviest feeds, and combined with the hydraulic bar feed, reduces operating effort while saving time.

These and many more time and labor saving features combine to make THE NO. 21 SADDLE TYPE TURRET LATHE outstanding for both bar and chucking work.

A blue print or sample of your work will permit our engineers to offer their recommendations.

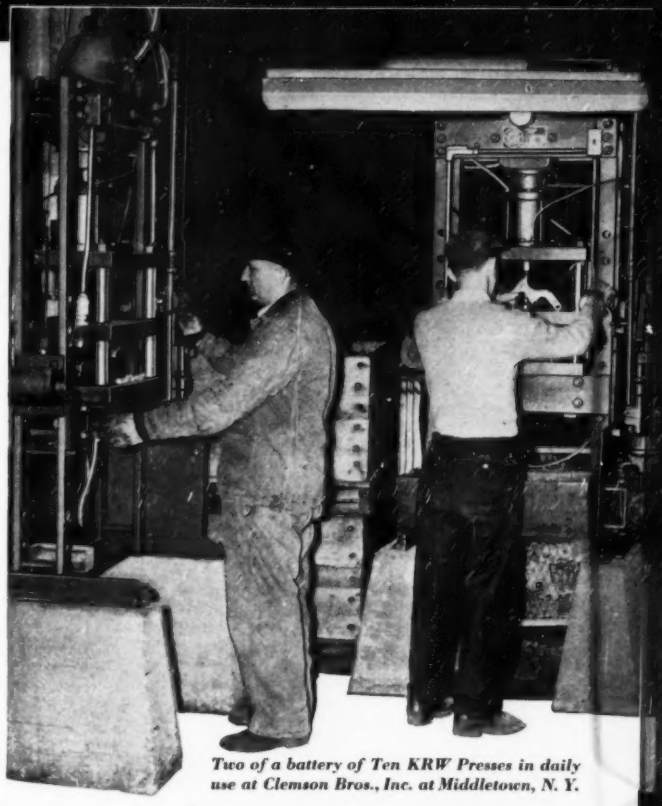
Builders of a complete line of Ram and Saddle Type Turret Lathes, also Hydralectric, Hydraulic and Hand Operated Cut-Off Machines

BARDONS & OLIVER, INC.

1133 WEST 9TH STREET • CLEVELAND 13, OHIO

KRW PRESSES *help build* BETTER LAWN MOWERS

CLEMSON BROS., INC. USES A BATTERY OF 10 KRW 25-TON PRESSES TO BOOST PRODUCTION



Two of a battery of Ten KRW Presses in daily use at Clemson Bros., Inc. at Middletown, N. Y.

● Clemson Bros., Inc.— nationally known manufacturers of quality lawn mowers and Star Hacksaw blades and frames...utilizes a battery of ten KRW 25-ton motor-driven hydraulic presses to perform a wide variety of production operations. They say..."The use of KRW Presses in our plant has increased production." The ingenious manner in which standard low-cost KRW presses have been adapted to specific jobs by this manufacturer reflects great credit on the calibre of their production and engineering executives. KRW Presses are highly adaptable. Best proof of this can be found in the many thousands in daily use in almost every industry. They can be furnished for either vertical or horizontal ram travel. Distance between uprights can range from 1 foot to 7 feet or better. Daylight, from inches to six feet and more. This is flexibility at low-cost. KRW Press tonnages vary from 25 to 100-ton capacity. They are available either hand-operated, air-operated or motor-driven. Tell us your problem ...we are equipped to engineer the press to the job. Mail the coupon for the facts.

GET THE FACTS!

MAIL THE COUPON TODAY!

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Please send me information on KRW Hydraulic Presses.

☐ Hand-Operated ☐ Air-Oil Operated ☐ Motor-Driven

Name .....

Address .....

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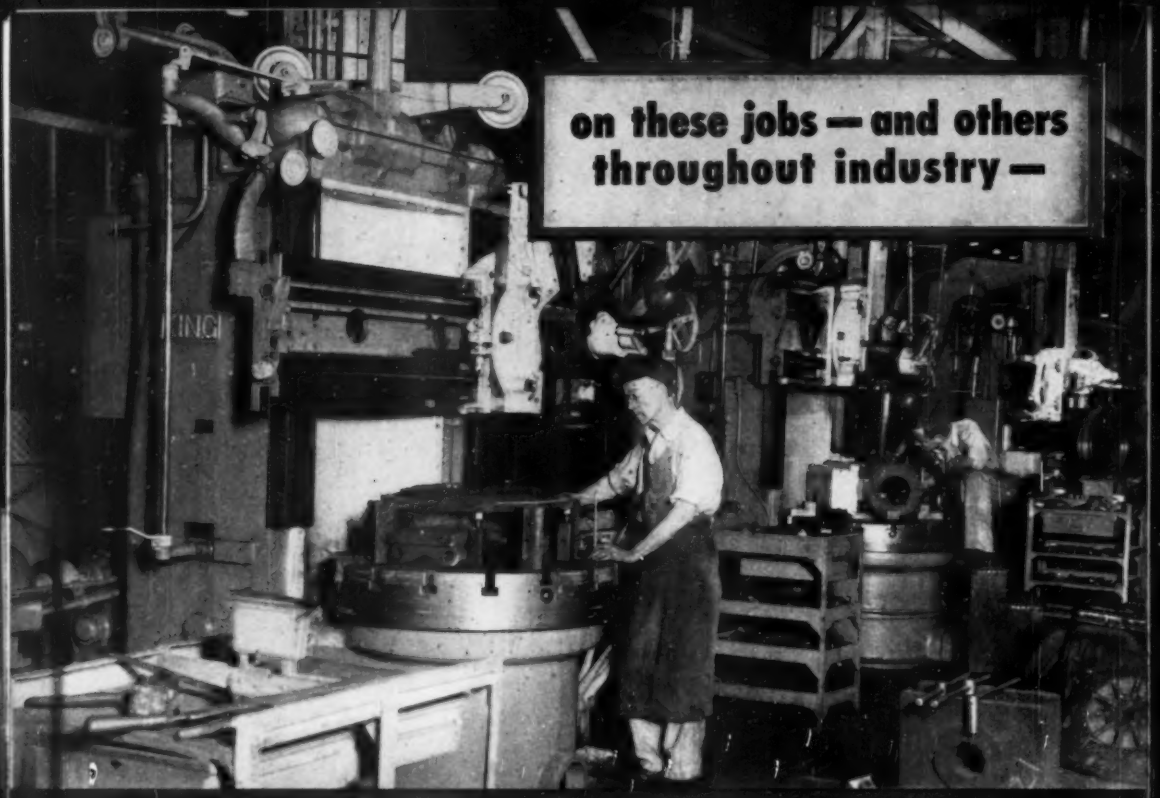
11



KING VERTICAL BORING & TURNING MACHINES *Pay Profits!*

Here are two 42" King Vertical Boring and Turning Machines busy turning out a wide range of production in one of the major shops of a prominent railroad. In addition to the cylinder head and crosshead shown being turned and bored, other jobs that are put on these versatile King machines include piston and cylinder plate castings, bearings, hub liners, cylinder bushings, boxes of all kinds, packing rings, and many other locomotive parts.

Throughout industry King Vertical Boring and Turning Machines are kept busy *all* the time, for they have the *built-in* ability to take on a wide variety of jobs and turn out the work fast, accurately, and at reduced costs. Modern machine tools are a sound investment. Consult a King engineer on your boring and turning requirements. It costs you nothing—and it can help you pave the way for substantial savings in easier, faster, and better production.

The New Series KING Single column machines, 30", 36", and 42" swing. Double column machines from 52" to 144" swing. All available with or without side head. Write for bulletins giving complete specifications on size machines that meet your work requirements.

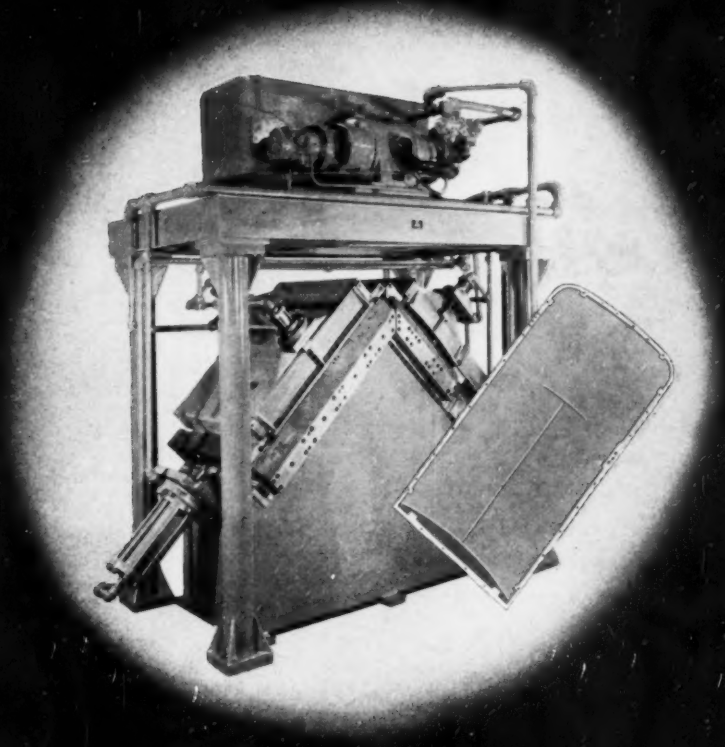
American Steel Foundries

KING MACHINE TOOL DIVISION

CINCINNATI 29, OHIO

Builders of King Vertical Boring & Turning Machines and Sebastian Lathes

IMAGINE!
1 PANEL—
7 SECONDS



HYDRAULIC FLANGE AND PIERCING MACHINE

speeds intricate panel fabrication for many end products

Vulcan's automatic flange and piercing machines are rapidly replacing older methods which use conventional punch press set-ups, multiple dies involving maintenance, and manpower. By applying the Vulcan Hydraulic Technique, presses are released for other work, labor charges reduced, and production increased amazingly. Considering the above application only . . . material moves to both sides of the machine, permitting bottom and hinge edge form and holes pierced on the one hand — top and handle edge together with holes pierced on the other, resulting in one complete panel each machine cycle, at 7 seconds.

Vulcan Hydraulics
Form
Pierce
Flange
Assemble

The Hydraulic Machine principle for Die Operations can be utilized in many panel forming and piercing applications. Mail us your product part prints for our advise or quotation. No obligation.

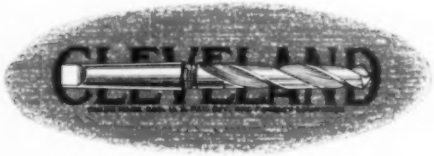
Vulcan Tool Co.
DAYTON 10, OHIO, U. S. A.
COMPLETE TOOLING PROGRAMS

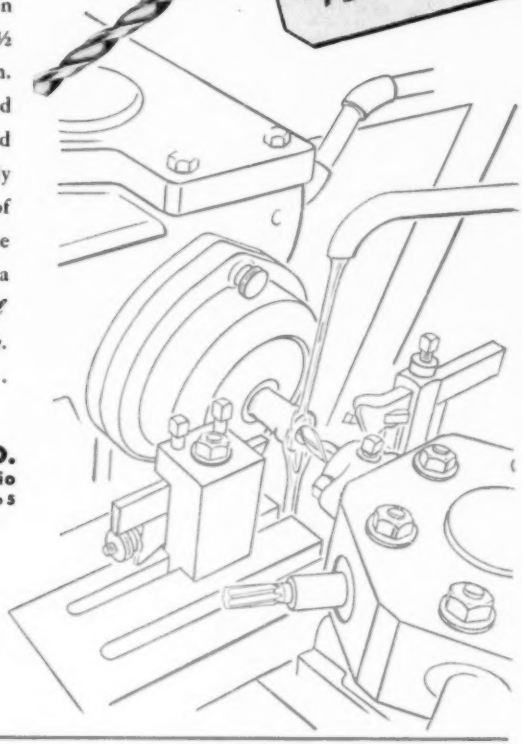
It Pays to Use the Right Drill

A midwestern plant was getting only fair results on a difficult machining operation—drilling holes 1½ inches deep in a stainless steel link pin at 2,125 r.p.m. ◈ A *Cleveland* Service Representative was called in. He studied the job carefully, and recommended a CLE-FORGE High Speed Drill that was especially designed for this type of work. Result: Number of holes per grind was *more than doubled.* Both were stock drills; both priced the same. But what a difference in performance! ◈ Perhaps a *Cleveland* Service Representative can be equally helpful to *you.* Get in touch with our nearest Stockroom, or . . .

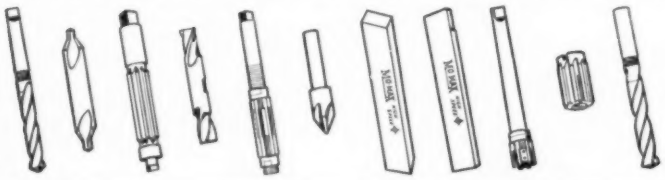
Telephone Your Industrial Supply Distributor.

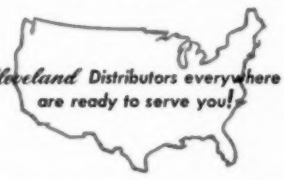
THE CLEVELAND TWIST DRILL CO.
1242 East 49th Street Cleveland 14, Ohio
Stockrooms: New York 7 • Detroit 2 • Chicago 6 • Dallas 1 • San Francisco 5 Los Angeles 11 • London W. 3, England

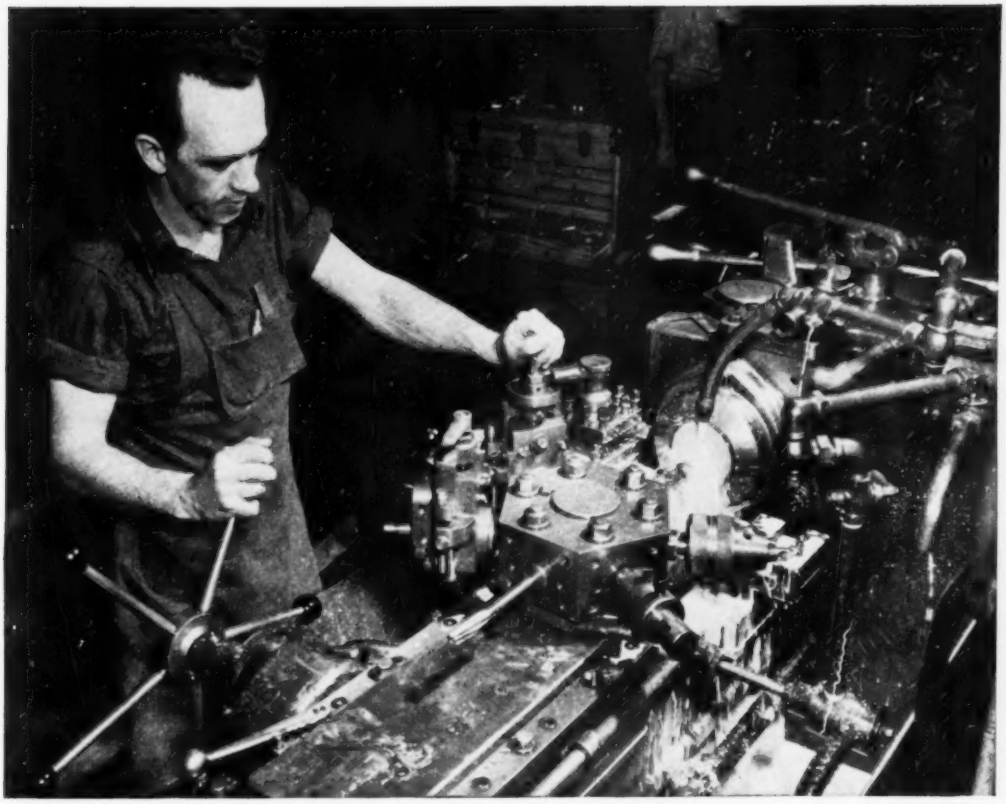




ASK YOUR INDUSTRIAL SUPPLY DISTRIBUTOR FOR THESE AND OTHER CLEVELAND TOOLS





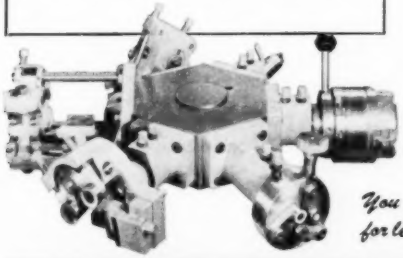


PICTURE OF A MAN PRODUCING 25% MORE

Same job, same operation, *But Better Tools!*

This shop has found it can do more jobs faster on Warner & Swasey Turret Lathes with the Standard Tooling Setups that fit their requirements. Multiple and combined cuts, with shorter setup time, mean profitable production increases.

● Electrol Incorporated, of Kingston, New York, transferred this precision Stop-Plunger job to a Warner & Swasey No. 3 Universal Turret Lathe because it had the speed and accuracy required, as well as the proper tooling for the job. The result was a 25% increase in production of this high pressure hydraulic control part.



Permanent Universal Tooling setups and the right tools which can help you increase your output are all in the new 194 page Warner & Swasey Tool Catalog. Write for your copy.

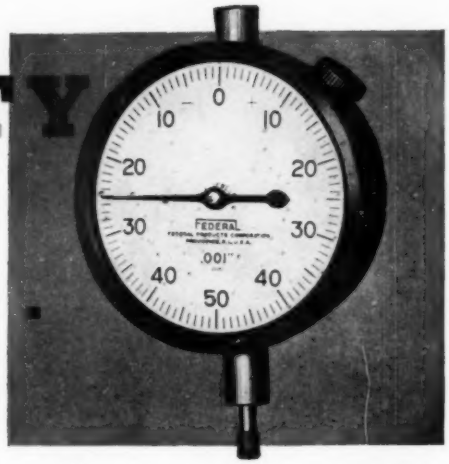
You can machine it better, faster, for less...with a Warner & Swasey

WARNER & SWASEY
Machine Tools
Cleveland

TURRET LATHES, MULTIPLE & SINGLE SPINDLE AUTOMATICS, PRECISION TAPPING AND THREADING MACHINES

VISIBILITY

wears a face like this . . .

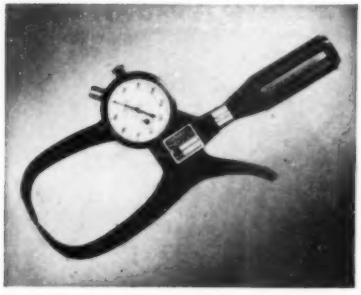


In telling time in measuring speed in calculating temperature in measuring pressure the dial face has proved the most satisfactory, the modern way of providing instantly-readable, plainly-visible measurements. And when it comes to gaging, many cost-conscious plant managers now know that Dial Indicator Gages cut down seconds and rejects save time and eliminate re-inspections.

Here is the modern inspection method that enables workers to *see* dimensions instead of *feeling* for them. They know not only whether the work is off, but the exact amount that it is off. And Dial Indicators have now been built into so diverse a range of gages, that there is a type for virtually every production problem involving dimensional control. Your control limits may be fine or coarse; Dial Indicator Gages give you *accuracy* and *speed*.

Pictured below—for example—is a Caliper Type Indicating Gage for checking outside dimensions. (Other models are made for inside dimensions.) These caliper gages are fast, handy and convenient to use. With the arms designed to your specific requirements, they permit measurement over, under or around all types of obstructions. You read the Dial Indicator and know at once if the dimension is right. For full details, please write for illustrated Bulletin #18.

We make both regular and custom-built gages to meet the needs of users in hundreds of industries. For highly specialized needs, we also make Air Gages and Automatic Electronic Sorting Gages. Our collective experience is available to you—through the Federal field representative in your territory or direct from our design department and factory. You may save both time and money by calling upon this experience.



FEDERAL

YOUR PROFIT DECISION IS *Visible PRECISION**

*The use of Dial Indicator Gages—visible precision—lowers inspection costs, raises production. Federal Products Corporation is America's largest maker of both standard and custom-built gages—mechanical, air, electronic—for the measurement of single and multiple dimensions.

1949 GOLD RUSH

It's '49 again, but the gold rush of the 1800's has become a different kind of struggle. In 1949, enterprising Americans aren't looking for nuggets. They're seeking profit through reduced manufacturing costs.

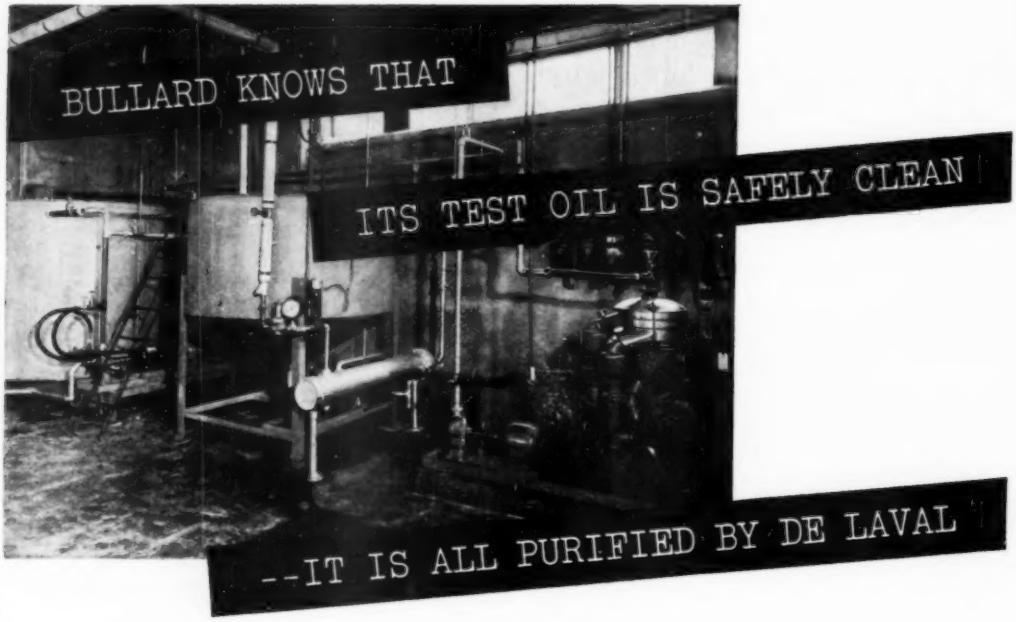
Many a Clearing press has been a real gold mine for its owner. Advanced design gives fast, efficient production. Extreme rigidity and precision give long die life, keep maintenance costs low, hold rejects to a minimum.

Whatever your press problem, Clearing's experience and engineering vision can help you.

CLEARING MACHINE CORPORATION
6499 West 65th Street · Chicago 38, Illinois

CLEARING PRESSES

THE WAY TO EFFICIENT MASS PRODUCTION



NEVER in the whole life of a machine tool is cleanliness of greater importance than when the machine tool or its component functional parts are tested.

The Bullard Company insures that all hydraulic oil used in testing its famous "Mult-Au-Matic" and other machine tools is centrifuged in the De Laval Oil Purification System. Being wholly mechanical in action, De Laval machines remove by centrifugal force all undesirable solids, but do not remove rust inhibitors.

De Laval Oil Purifiers when used to maintain test oils insure more ***reliable*** tests, just as De Laval Oil Purifiers used to keep many other kinds of factory oil in condition save maintenance expense and add to machine life. Often, as in the case of cutting oil, De Laval purification leads ultimately to better work—less rejects—as well as to longer cutting oil life.

Write for Bulletin MM-1 and check the application for De Laval Oil Purifiers **you** are most interested in.

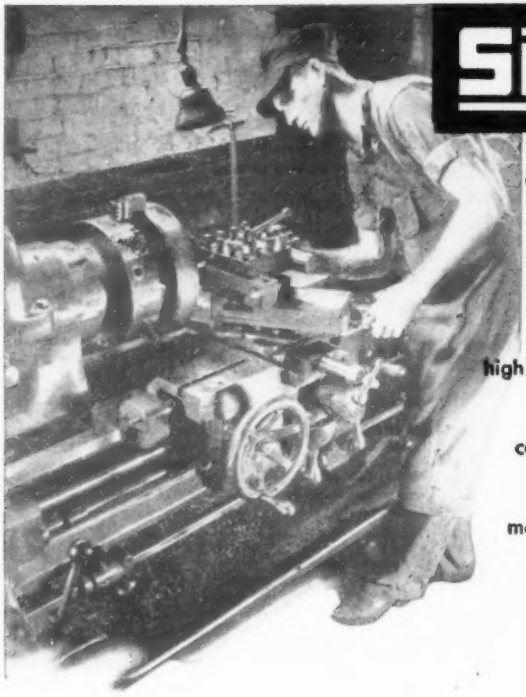
●

THE DE LAVAL SEPARATOR COMPANY
165 Broadway, New York 6 427 Randolph St., Chicago 6
DE LAVAL PACIFIC CO., 61 Beale St., San Francisco 5
THE DE LAVAL COMPANY, Limited, Peterborough, Ont.

DE LAVAL

PURIFIERS and CLARIFIERS FOR FACTORY OILS

Save more than the oil
• Save work!
• Save tools!
• Save machines!

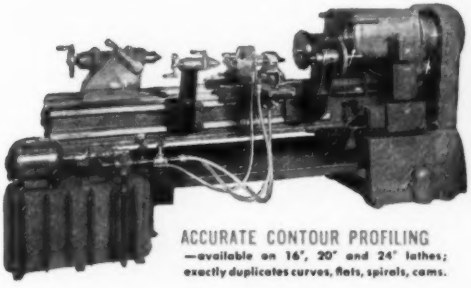


SPRINGFIELD

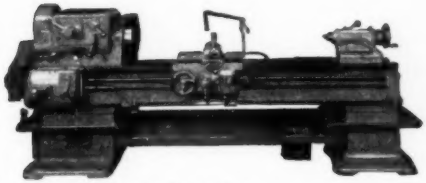
Geared Head LATHES

Springfield builds a complete line of precision, high quality, geared head lathes. Every type of lathe built by Springfield is especially designed and constructed to meet all the requirements of modern tooling, and to retain extreme accuracy through many years of full capacity production.

Write for catalogs and detailed specifications.

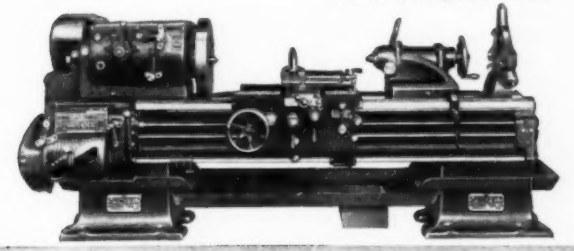


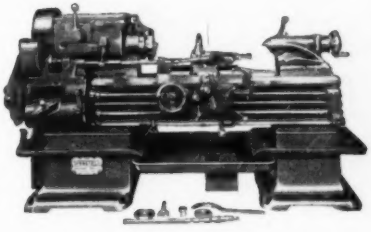
ACCURATE CONTOUR PROFILING
—available on 16", 20" and 24" lathes; exactly duplicates curves, flats, spirals, cams.



MANUFACTURING LATHE
—with unusually wide applications; capable of accurately turning, boring and facing.

SUPER DUTY LATHES
—made in 20" and 22" sizes; equipped with 16-speed geared heads.





TOOL ROOM LATHES
—made in all sizes including 24"; equipped with lead screw reversing mechanisms.

THE SPRINGFIELD MACHINE TOOL COMPANY

SPRINGFIELD, OHIO, U. S. A.

GENERAL DISTRIBUTORS: BRYANT MACHINERY & ENGINEERING COMPANY, 400 WEST MADISON ST., CHICAGO 6

Exclusive Representatives in All Principal Cities

SUN "JOB PROVED" PRODUCTS CUT COSTS,

Sun products have been "Job Proved" in the lubrication of almost every type of mining, manufacturing, power, and transportation equipment . . . in refrigeration and air-conditioning . . . in metal cutting, tempering, and quenching . . . in the processing of textile fibers, leather, natural and synthetic rubbers . . . in the impregnation of electrical, electronic, and packaging materials of many kinds.

To help you solve your production problems, Sun Oil Company offers a wide selection of "Job Proved" petroleum products, plus the experience of Sun Engineers. Their know-how and detailed product information are yours for the asking. Call your local Sun office, or write Dept. AM-1.

SUN OIL COMPANY • PHILADELPHIA 3, PA.

In Canada: Sun Oil Company, Ltd., Toronto and Montreal

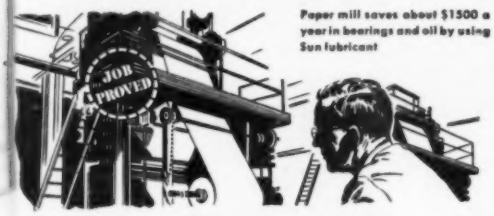
INDUSTRIAL OILS

SUNVIS 900 OILS—High-viscosity-index, paraffinic-type oils—of uniform O F pour point—fortified against rust, corrosion, oxidation, and sludge. The finest available lubricant for turbines, hydraulic systems, and similar applications.

SUNVIS HD 700 OILS—High-viscosity-index oils containing additives which minimize oxidation and give detergency. Ideal lubricants for internal combustion engines subjected to continuous heavy loads under the most adverse conditions.

SUNVIS OILS—Solvent-refined paraffinic-type oils of uniform high viscosity index, low pour point, and low carbon content. Especially suitable for application to long-time use in all types of industrial reservoirs and circulating systems.

DYNAVIS OILS—Low-pour-point, high-viscosity-index, inhibited oils, containing an additive which helps prevent formation of harmful corrosive and sludge-forming acids. Well suited for engines fitted with alloy bearings and operated at high temperatures.



Paper mill saves about $1500 a year in bearings and oil by using Sun lubricant

SOLNUS OILS—Well-refined straight mineral oils. Stand up under hard use for long periods of time. Recommended for use in machine tools, air compressors, certain types of diesels, etc.

CIRCO OILS—Used for general lubrication of industrial machinery when straight mineral oils are required.

SUNTAC OILS—100%-petroleum products which have been compounded to increase their adhesiveness. Recommended for general lubrication of all machines subjected to sudden shocks and load reversals. Cling to the parts to be lubricated.

STEAM CYLINDER OILS—High flash and fire point lubricants for either saturated or superheated steam conditions and for worm-gear speed-reduction units.

SUN CAR JOURNAL OILS—Dark oils meeting A.A.R. Specifications. For use in waste-packed bearings of railroad equipment.

SUN DELAWARE OILS—Dark oils for general lubrication on older types of industrial machinery.

SUNOCO WAY LUBRICANT—For use on tableways. Eliminates chatter and scoring . . . resists corrosion. Has good metal-wetting and adhesive properties, ample viscosity, and E. P. qualities.

SUN MARINE ENGINE OILS—Compounded with special emulsifying agents in order to provide adhesion to, and lubrication of, working parts in the presence of water. For the lubrication of bearings, eccentrics, crossheads, and various other parts of steam engines.

ROCK DRILL OIL—High-film-strength adhesive oil. For use in jackhammers, stopers, drifters, and similar equipment.

INDUSTRIAL GREASES

SUN CUP GREASES—Water resistant. For grease-cup and grease-gun application when service is normal.

SUN GUN GREASES—Smooth greases made with medium-viscosity oil. Stable under pressure in power and booster guns.

ADHESIVE PRESSURE GREASES—Won't drip or splash. Excellent lubricants for open-gear applications.

SUN DARK PRESSURE-SYSTEM GREASES—For power-driven central grease lubricating systems in heavy industries. Also used as a "medium cup grease."

SUN MINE CAR GREASES—Available in several grades. Suitable for both antifriction bearings and plain-bearing cavity-type wheels.

SUN MINING MACHINE LUBRICANT—Semifluid. For use where a light but adhesive grease is required. Resists separation and decomposition.

Chemical plant saves about $8000 per year by adopting Sun Pressure Grease

SUN ROLLER BEARING GREASES—For use on electric motors and generators and high-temperature machinery equipped with ball or roller bearings.

SUN GEAR COMPOUNDS—Black adhesive open-gear compounds and

"JOB PROVED" IN EVERY INDUSTRY

SUN PETROLEUM

SPEED PRODUCTION, IMPROVE QUALITY

wire-cable greases. Recommended for power presses, mining machinery, worn reduction mills, crushers, pump gears, etc.

SUNOCO TRACTOR ROLLER COMPOUND—For crawler-type tractors. Provides good lubrication with exceptional sealing qualities.

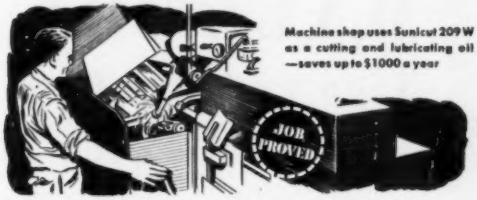
METALWORKING OILS

SUNICUT—Straight (non-emulsifiable) transparent cutting oils. Recommended for automatic screw machines and heavy-duty machining operations. Permit high speed production with excellent finishes, long tool life.

SUNOCO EMULSIFYING CUTTING OIL—A self-emulsifying oil which produces a stable white emulsion. Efficient and economical cooling and lubricating medium for turning, milling, drilling, and other metalworking operations on both ferrous and nonferrous metals. It is also an excellent grinding coolant.

SUN QUENCHING OILS—Specially refined oils designed to aid development of maximum physical properties in a wide variety of steels.

SUN TEMPERING OILS—Specially refined oils for tempering steel. Because of their low carbon content and stability under heat, these oils have an unusually long service life.



Machine shop uses Sunicut 209 W as a cutting and lubricating oil —saves up to $1000 a year

SUN ROLLING OILS—Straight and emulsifying oils which will permit maximum production in rolling steel, aluminum, brass, and copper.

SUN ANTI-RUST COMPOUNDS—Petroleum-base oils with chemical additives designed to prevent the rusting and corrosion of steel.

REFRIGERATION OILS

SUNISO REFRIGERATION OILS—Have extremely low pour points, extremely low wax-separating characteristics, a high degree of stability and long life. Initially neutral and resistant to formation of detrimental acids under service conditions. Suniso Oils are high quality oils suitable for both high- and low-temperature operations. The most widely used oils in refrigeration and air-conditioning.

Sports arena steps up compressor efficiency 15% by switching to Suniso Oil

TEXTILE-PROCESSING OILS

SUNOTEX TEXTILE OILS—Designed to impart certain additional properties to various forms of fibers during their processing from the fiber state into a manufactured product. All Sunotex textile oils are emulsifiable in water. Highest rating in fadometer tests.

SUN COTTON CONDITIONING OILS—Pale mineral oils which condition the cotton. They prevent waste by cutting down excessive amounts of "fly" (fine air-borne lint particles).

Worsted mill obtains easier scouring, better quality, larger yield with Sunotex WO-235

SUN ASBESTOS FIBER CONDITIONING OIL—Used for spraying on the asbestos during processing. Fibers are kept from being damaged or broken down, and harmful dust is minimized when this product is used.

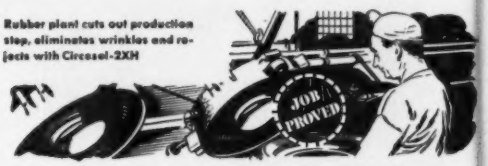
SUN CORDAGE OILS—Generally used alone, but are adaptable to various formulas used by cordage manufacturers. Selected products, highly compatible with additives.

RUBBER-PROCESSING AIDS

CIRCOSOL-2XH—An elasticator and processing aid for natural rubber and especially for GR-S. Outstanding for sponge rubber.

CIRCO LIGHT PROCESS AID—A processing agent and excellent softener for natural rubber, natural rubber reclaims, and neoprene synthetic rubber. Used for GR-S to some extent.

SUNDEX-54—An inexpensive product suitable for processing GR-S and blends of GR-S and natural rubber. An established processing aid for rubber footwear stocks and semihard rubbers.



Rubber plant cuts out production step, eliminates wrinkles and rejects with Circosol-2XH

CIRCOMAR-5AA—A black-colored product for processing natural and GR-S rubber used in tire-making. Also used in reclaiming natural-rubber scrap. Replaces asphalt fluxes. Free-flowing at room temperature.

WAXES

Sun's new wax plant will be completed in 1949. Its many refining innovations and extreme flexibility will permit new types of waxes to be manufactured in large quantities—a procedure heretofore impracticable. A wide range of fully refined paraffin and microcrystalline waxes will be "tailor-made" to meet the requirements of virtually all major industrial applications. Pilot plant samples of several grades are now available.

MISCELLANEOUS INDUSTRIAL PRODUCTS

SUN SOLVENTS—Sun Spirits for the thinning of paints, varnishes, and enamels, and for metal-cleaning . . . a pure, water-white petroleum solvent free of corrosive sulphur. Other Sun solvents with special properties are available for the chemical industry.

SUN LEATHER OILS—Mineral-base leather oils. Used for obtaining the desired tensile strength, proper temper, and controlled moisture content. Maintain a light even color . . . mix well . . . distribute evenly.

"JOB PROVED" IN EVERY INDUSTRY

PRODUCTS SUNOCO

A Portion of the Large Stock Maintained for 24-hour Stock Shipments.

INTERCHANGEABILITY IS A MUST AT THE RESISTANCE WELDING ELECTRODE HEADQUARTERS

"Standards" mean Savings... with MALLORY Tips and Holders *for* RESISTANCE WELDING

"Standards" save Time. Standard Mallory Tips and Holders are on their way to you in 24 hours. When you order Mallory "standards" you eliminate the delay that special tools and fixtures require.

"Standards" save Money. Three out of every five resistance welding problems can be solved with a proper combination of standard Mallory tips and holders. Mallory "standards" comprise a complete line developed through 20 years of precision know-how.

Before you lay out time and money on "specials" . . . investigate Mallory "standards". It pays!

In Canada, made and sold by Johnson, Matthey & Mallory, Ltd., 110 Industry St., Toronto 15 Ontario.

Resistance Welding Tips, Holders, Dies, Rod and Bars, Castings, Forgings

P. R. MALLORY & CO. Inc.

MALLORY

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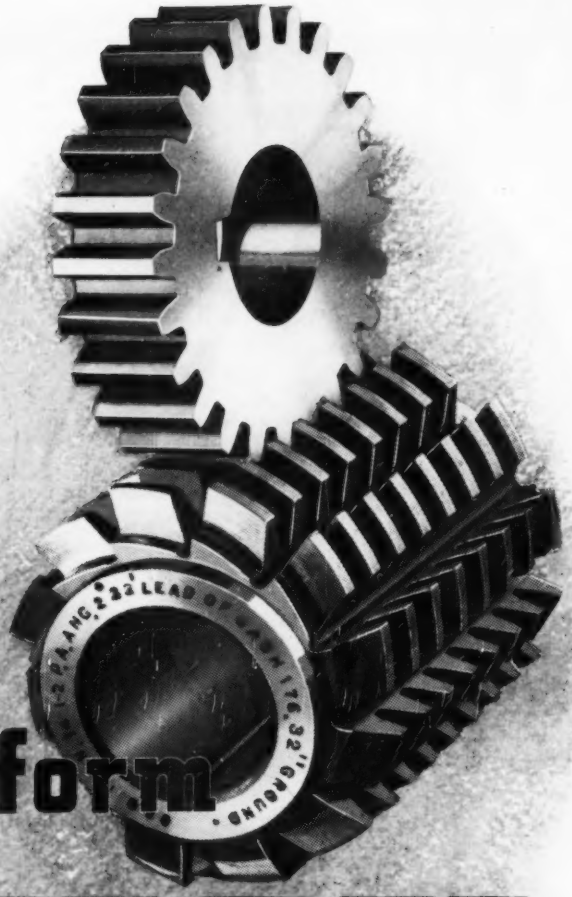
SERVING INDUSTRY WITH

Capacitors	Rectifiers
Contacts	Switches
Controls	Vibrators

Power Supplies

Resistance Welding Materials

no other hob will outperform a UNION



See Catalog R
for various types of hobs

contact your local distributor

UNION TWIST DRILL COMPANY, ATHOL, MASSACHUSETTS

MILLING CUTTERS • GEAR CUTTERS • TWIST DRILLS • HOBS • REAMERS • CARBIDE TOOLS

We own and operate S. W. CARD MANUFACTURING CO. Division, Mansfield, Mass., Taps, Dies, Screw Plates.

BUTTERFIELD DIVISION, Derby Line, Vt., Taps, Dies, Screw Plates, Reamers.

BUTTERFIELD DIVISION, Rock Island, Que., Milling Cutters, Twist Drills, Hobs, Reamers, Taps, Dies, Screw Plates.

KENNAMETAL'S PLUS VALUE

Helps Offset

MONEY'S MINUS VALUE

Living costs for the business family have soared to alarming heights. Prices for every item that enters into the cost of production—equipment, labor, supplies—have been adversely affected by the minus value of United States dollars. "Managed currency" has increased the supply of money *and* inversely decreased its buying power.

An effective means to halt inflation and stabilize our economy is a return to the redeemable Gold Standard*.

In the meantime, technological developments help mitigate the demoralizing effect of high prices. Tools that reduce unit costs add value to the production dollar. An outstanding example is Kennametal.

Carbide tools, as a class, have the inherent capacity to speed up machining operations. When the properties of hardness and strength are sustained at consistent values then performance reliability is high and tool maintenance low.

Kennametal is made by distinctive processes that long experience has proved to be the most effective for producing a close-grained physical structure, free from porosity. Because of this soundness and uniformity, all Kennametal compositions have a plus value.

The dependable, day after day performance of Kennametal tools, together with their unusual durability, help sustain the continuity of machine output and thus make production dollars more valuable.

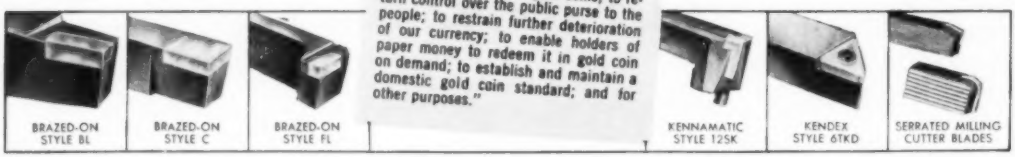
Kennametal tools and blanks, in eight grades and hundreds of styles and sizes, are described in our Catalog 48. You can make selections to suit your needs with full assurance of outstanding value.

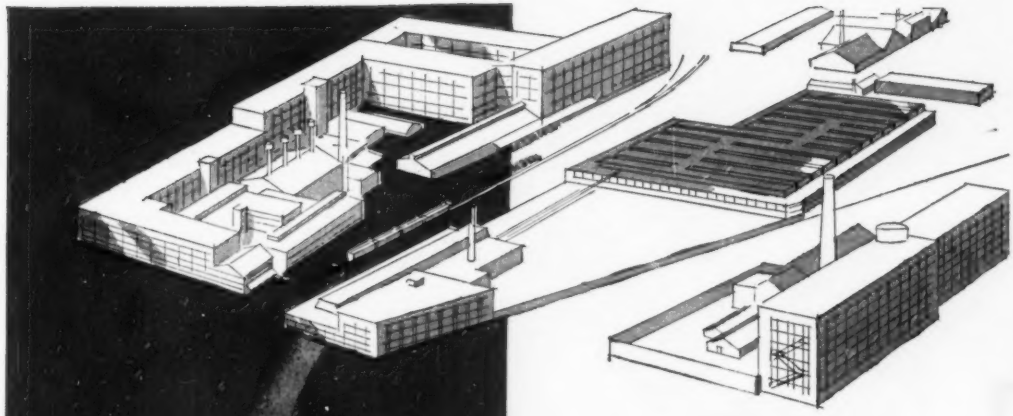
* **Bill H. R. 5031** introduced into the House of Representatives, January 20, 1948, by Congressman Buffet of Nebraska cited as the "Gold Standard Act of 1948."

A BILL

"To restore the right of American citizens to freely own gold and gold coins; to return control over the public purse to the people; to restrain further deterioration of our currency; to enable holders of paper money to redeem it in gold coin on demand; to establish and maintain a domestic gold coin standard; and for other purposes."

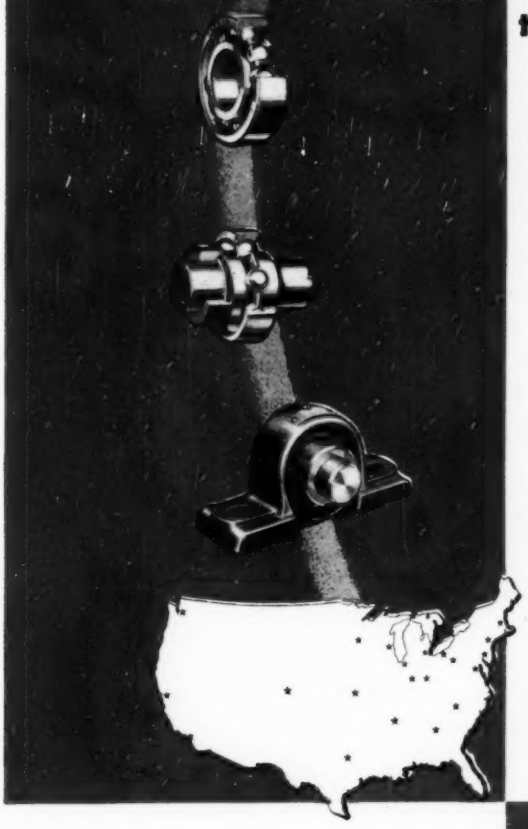
KENNAMETAL
SUPERIOR CEMENTED CARBIDES
KENNAMETAL Inc., LATROBE, PA.





An ATTITUDE and an APTITUDE that built a 17-acre plant

This is a "success story"... yours as well as ours. Because there had to be manufacturers like you designing machines and equipment that created new requirements in ball bearings before an idea could grow into a seventeen acre plant. This idea is a combination of an attitude and an aptitude... a way of looking at ball bearings from where you're sitting ...and an aptitude for doing just what you'd like done about it... gained from solving the bearing problems of not just one or two but of all industries.



The most complete service ... then the most complete line

A lot of people think we do nothing but special jobs ... because our service is special for them. Actually, a lot more manufacturers are finding that their problems have already been solved by Fafnir. One man's "special" bearing becomes standard for a whole industry and sometimes a group of industries. That's how Fafnir's complete service to ball bearing users built "the most complete line in America".

Wherever you are, there are Fafnir Ball Bearings and Fafnir Service

Fafnir's industry-wide experience and skilled cooperative engineering are available at the 21 branch offices shown on this map. The Fafnir Bearing Company, New Britain, Conn.

MOST COMPLETE LINE IN AMERICA

FAFNIR
BALL BEARINGS

"600" SERIES

BEARING METAL *FOR TOUGH JOBS*

- High strength
- Resistance to wear
- Corrosion resistant

MUELLER BRASS CO.

"600" has been successfully used for many years as the solution to many extremely difficult bearing problems. It is a true bearing metal and—an entirely different one. "600" can be drawn or forged and readily fabricated in a great variety of sizes and shapes.

Many thousands of auto and truck transmissions have their reverse idler gears running on shafts of "600". A large quantity of it has been very successfully used for pump rods and other purposes where lubrication may be neglected.

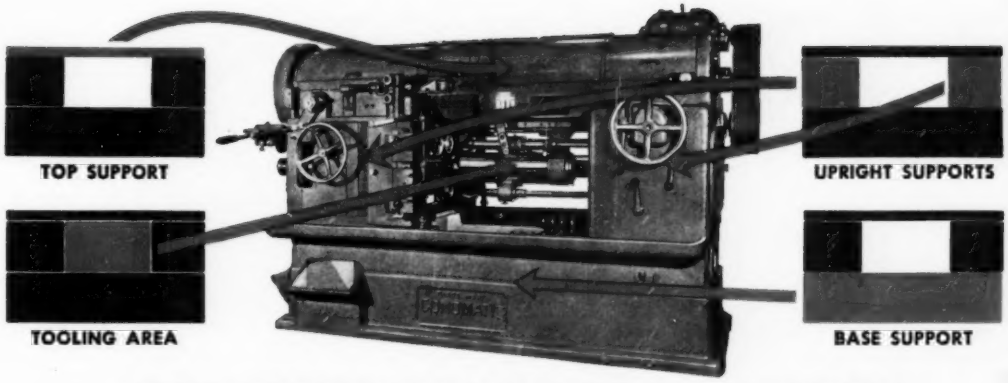
"600" IS IDEAL FOR PROPELLER SHAFTS IN POWER BOATS AND HUNDREDS OF OTHER USES, SUCH AS SPINDLES, SEAL RINGS, BEARING RINGS, WORM GEARS, CONNECTING RODS, CAMS, THRUST WASHERS, SUPER-CHARGER SHAFTS, ELECTRICAL, AIRCRAFT AND AUTOMOTIVE EQUIPMENT, CONTROL APPARATUS AND MARINE HARDWARE.

LIGHTER WEIGHT

Higher speeds and lighter weights are being demanded by leading designers of the most modern equipment. "600" Metal is specified for bearings because of its adaptability to meet the most exacting requirements. "600" Metal is approximately 8% lighter in weight than phosphor bronze alloys.

If you have a bearing problem, write us. We will supply you with samples of material for testing your own application. A complete booklet on "600" Series Alloys is yours for the asking.

PORT HURON, MICHIGAN •



GOOD DESIGN IS CONSISTENTLY GOOD

All builders of horizontal type multiple spindle automatic bar machines emphasize the importance of substantial frame support to maintain work and tool alignment and insure durable low-cost machine performance. Some have stressed the advantages of box-type frame design and construction. But only Cone has consistently applied these fundamentals by providing a horizontal, rectangular tooling area for a horizontal type machine. Two frame designs for horizontal type multiple spindle automatics were submitted to automatic users to meet the general requirements here listed. The 100% choice is illustrated above. The Conomatic is its sole representative.

	MACHINE #1*	MACHINE #2	MACHINE #3	MACHINE #4	MACHINE #5
WORK & TOOL CAPACITY	✓				
WORK & TOOL SUPPORT	✓				
WORK & TOOL MAINTENANCE	✓				

*CONOMATIC •

Any good investment has certain qualifications that prove it profitable. The wise investor and smart banker have some sort of measuring stick to analyze every investment they make. Why not use a chart to guide your purchases of Automatic Bar Machines? If you are already using a chart, perhaps you would like to compare it with the one that we have prepared. Write to us for a copy or ask your Cone representative.

WORK & TOOL CAPACITY

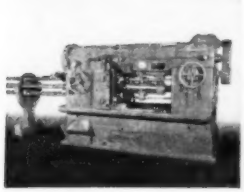
Long, open, roomy Tooling Area and long main end slide for handling longer work and for clearing die heads in threading, etc., to the full collet capacity of the machine; for heavy cross-slide cuts, deep hole drilling, and general all-round work with HSS or Carbide Tools.

WORK & TOOL SUPPORT

Genuine, horizontal, rectangular box-frame free of overhang; heavy-set, rigid upright members for supporting headstock and gear box units between heavy, full-length top and base members, for substantial support of all work and tools close to the work and tool axis, and for the maintenance of accurate alignment of work and tools.

WORK & TOOL MAINTENANCE

Heavy, strong, well supported, overhang-free, vibration-free, liberal bearing, convenient, adjustable, work holding units and tool slides, with accessible chip-free cams, with adequate capacity in base member for chip disposal and cutting coolant.



A comparison with ALL Automatics will lead you to

Conomatic

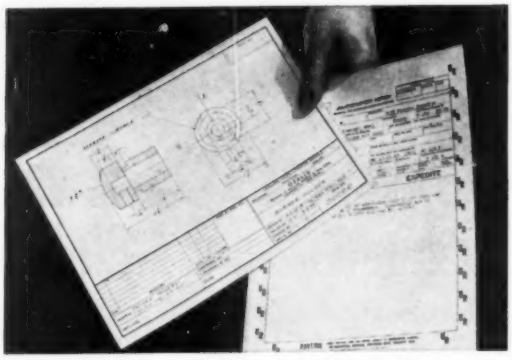
#2

CONE AUTOMATIC MACHINE COMPANY, INC.
WINDSOR, VT., U.S.A.

If you copy ANYTHING typed, drawn or written, you need OZALID!

It's Simple . . .

Take any letter, sales report, form, drawing . . . anything typed, drawn or written. Put it next to a sheet of Ozalid material (paper, plastic, cloth, black, blue, red, sepia) and feed it into an Ozalid machine.



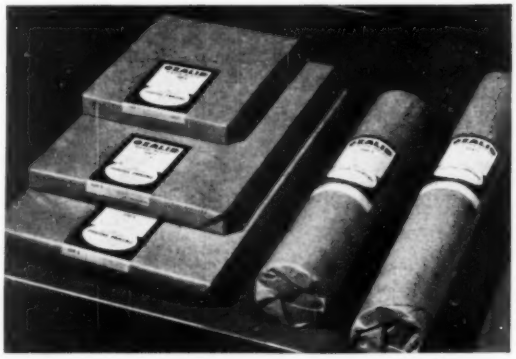
It's Quick . . .

In as little as *25 seconds*, you (anyone can operate Ozalid) will have a *dry, positive, exact* duplicate of your original material! Ozalid copies can be used as masters to obtain more copies! No proofreading . . . no mistakes . . . no delay!

It's OZALID!

You can make Ozalid copies any length, and almost any width. You can make them directly from translucent material, and from opaque originals with an intermediate step.

Write today on your letterhead for FREE booklet which tells the full Ozalid story, shows all the Ozalid prints, or consult your classified directory for local distributor.



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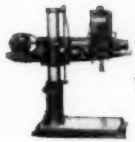
Dept. 10, Johnson City, N. Y.

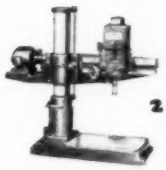
A Division of General Aniline & Film Corporation. *"From Research to Reality"*

Which SUPER SERVICE will suit your JOB?

For greatest savings in drilling cost The Cincinnati Bickford Tool Company offers a complete line of 34 different sizes and types of drilling machines. One of these machines will cut your drilling costs more efficiently. Our engineers will help you select the proper machine for your work, or if you prefer, send for any or all of the bulletins pertaining to the machines that interest you.

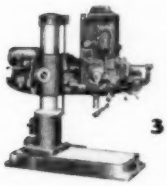

1

1. The smallest SUPER SERVICE Radial Drill manufactured by The Cincinnati Bickford Tool Company, as described in Bulletin R-26A, has a 7½" diameter column and a 2½' arm length. This machine is furnished with 6 speeds and 3 feeds and a 1 HP driving motor.


2

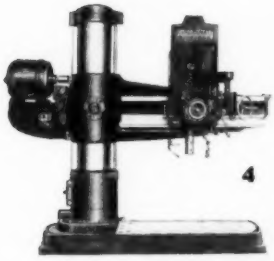
2. The 9" Diameter Column SUPER SERVICE Radial Drill, as described in Circular R-21B, is built in either a 3' or 4' arm length with 9 speeds and 4 feeds powered with a 3 HP driving motor.

3. SUPER SERVICE Radial with 11" dia. column is described in Bulletin R-29. Built with a 3', 4' or 5' arm. 12 speeds and 6 feeds or 36 speeds and 18 feeds furnished. Powered with either a 5 or 7½ HP driving motor.


3

4. The 36-speed 18-feed SUPER SERVICE Radial Drill, as described in Booklet R-29, is furnished in 11 different standard sizes, ranging from 4' to 8' arm lengths and 13" to 19" diameter columns. These machines are furnished with 7½ to 20 HP driving motors.

5. The SUPER SERVICE Master Radial Drill, as described in Circular R-22, is built in 7' to 12' arm lengths and in 22" and 26" diameter columns. This machine has 36 speeds and 18 feeds powered by motors from 20 to 40 HP.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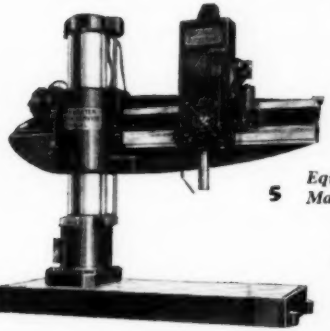
6. The SUPER SERVICE Portable Horizontal Drilling Machine with 6 power feeds and 1½ HP driving motor is more fully described in Bulletin HR.

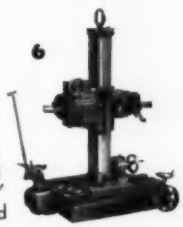
7. The SUPER SERVICE High Production Manufacturing Type Uprights have many of the advantages of the general purpose drilling machines but, due to their simplified construction, they are much more economical. They are furnished in 21", 24" and 28" sizes with 3, 5, 7½ or 10 HP driving motors. Booklet U-27 will furnish you more complete details.


5

8. The new SUPER SERVICE Precision Drilling Machine is especially suited to operations in conjunction with an automatic spacing table. This 36-speed 18-feed 15 HP motor machine is more completely described in Circular FH.

9. The SUPER SERVICE General Purpose Upright Drilling Machines, as described in Booklet U-25, are furnished in 21", 24" and 28" sizes. From 9 to 12 speeds and 4 to 9 feeds. The machines are powered by either 3, 5 or 7½ HP motors.

10. The SUPER SERVICE Jig Boring Machine, as described in Bulletin U-26B, is furnished in 12 speeds and 9 feeds with a 3 HP driving motor.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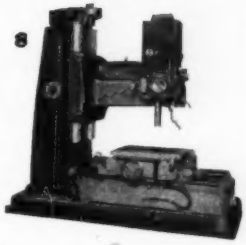
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9

10

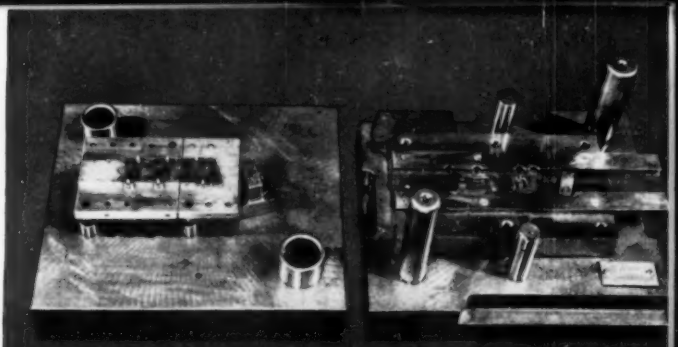
Equal Efficiency of Every Unit Makes the Balanced Machine

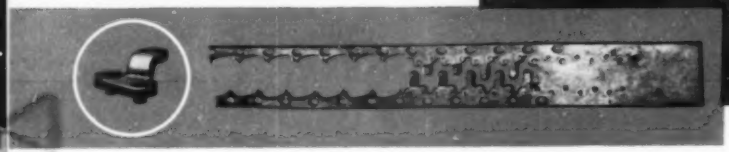
SUPER SERVICE

THE CINCINNATI BICKFORD TOOL CO.

Oakley, Cincinnati 9, Ohio, U.S.A.

10,800 Stampings per hour using DANLY Precision Die Set





two post set maintains accurate punch and die relationship

This 9-station progressive die setup produces two small offset brackets at a time from AISI-1008 steel strip stock 1⅜" x .071" at a press speed of 90 strokes per minute. The press delivers a gross production of 10,800 pieces per hour. A Danly all-steel two-post precision die set maintains tolerances of + .002" on the depth of the offset. Depth of embossing is held to .005".

250,000 pieces per die grind

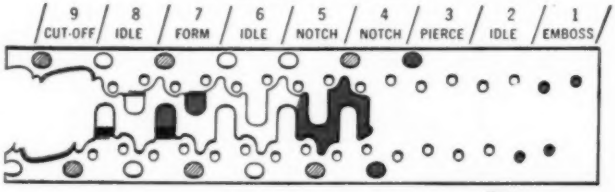
On a total production of 750,000 pieces, an average of 125,000 strokes or 250,000 parts has been obtained per die grind. The precision built into Danly Die Sets (leader pins and bushings are held to limits of .0002 of an inch) helps you obtain a longer die life and lower stamping costs. Get top performance—specify Danly Precision Die Sets for every job. They're available for any type of press operation.

save time USE DANLY NATION-WIDE DIE SET ASSEMBLY SERVICE

Use Danly's specialized service to save time and money. Assembly plants listed below (marked with stars) stock interchangeable parts for quick assembly and delivery of any standard die set to suit your specifications.

- ★ **Chicago 50,** 2100 S. 52nd Ave.
- ★ **Cleveland 14,** 1550 E. 33rd St.
- ★ **Dayton 2,** 990 E. Monument Ave.
- ★ **Detroit 16,** 1549 Temple Ave.
- ★ **Grand Rapids,** 113 Michigan St., N.W.
- ★ **Long Island City 1,** 47-28 37th St.
- ★ **Los Angeles 54,** Ducommun Metals & Supply Co., 4890 S. Alameda
- ★ **Milwaukee 2,** 111 E. Wisconsin Ave.
- ★ **Philadelphia 44,** 18 W. Chelten Ave.
- ★ **Rochester 4,** 16 Commercial St.

OPERATION CHART



Note: Shaded holes show pilot positions.

Write for this *free* bulletin

Illustrates how Danly's machining and welding service for special die sets will help you save additional time and money.

DANLY

DANLY MACHINE SPECIALTIES, INC.
2200 SOUTH 52ND AVENUE, CHICAGO 50, ILLINOIS

25 YEARS OF DEPENDABLE SERVICE TO THE STAMPING INDUSTRY

PRECISION DIE SETS...STANDARD AND SPECIAL • MECHANICAL PRESSES AND PRESS EQUIPMENT

SPOT NEWS OF METALWORKING

Canadian plane makers wish to build units for U.S. Air Force. Two deals are pending: Canadair Ltd., Montreal, owned by Electric Boat Co., would be licensed to make all products of Fairchild; and DeHavilland Aircraft, Toronto, would build North American's F-86A, swept-wing jet fighter which holds world air-speed record. These deals have approval of U.S. Air Force. Canadians can make these planes at 25% less cost than here, saving being in labor.

Four-man mission is enroute to Japan to see how much iron and steel scrap may be available for export to U.S. Mission will be in Japan 30 to 60 days.

Blow-up is reported imminent in CIO Electrical Workers Union over growing sentiment for removing left-wing leadership. Left-wingers have been pushed out of UE locals at Westinghouse in Pittsburgh and at General Electric at Schenectady and Cleveland.

Changes and cancellations in the aircraft program will not affect jet-engine tooling at Westinghouse as the company is working solely on Navy contracts. General Electric is so far behind now on orders that the change will only serve to bring it up to date.

Steel will be made available for ore cars to be used by Union of South African Railways for transporting manganese-bearing ore in an effort to increase U.S. supply of the strategic metal in the face of a Russian move to reduce exports to this country.

Argentina has arranged to purchase $24 million in diesel trains and railroad material from Hungary under the trade agreement of last July. Shortage of dollars on the part of Argentina has caused U.S. firms to hold back or reduce shipment of many orders placed here.

British locomotive company plans to build plant in Union of South Africa to turn out heavy locomotives for shipment to all parts of the world. An expenditure of $4 million is being studied.

Metalworking industry held its own during December as compared to November. The American Machinist Index of Metalworking Production was unchanged at 224. Four of the five components dipped slightly but strength in output of automobiles and trucks kept the figure firm.

100 Italian engineers and technicians are on their way to Argentina with car parts and frames as the first contingent of a group to organize a new automobile plant in Buenos Aires. Available labor in Argentina will be tapped, to be supplemented later by Italian immigrants. Target is 50 to 60 cars per day.

Metalworking manufacturers in western Germany are aiding their fellow German manufacturers in the Russian Zone, including competitors, to get out and establish factories in the western zone. Zeiss is already operating a complete new factory in western Germany.

Steel castings have become so much more available that some customers are refusing to accept deliveries in advance of designated dates.

Gaging Metalworking

January is turning out to be a good month for the nation's metalworking industries. Though output has slackened in certain segments, operations on the whole are estimated to be fully up to the November and December pace, or considerably more than double the 1939 volume. Production is humming especially in the automobile industry, with General Motors and Chrysler getting into manufacture of new models and Ford trying to catch up with heavy backlogs.

Higher Prices Seen

Industrial prices are expected to creep higher. The recent boost in freight rates was reflected immediately in a $1 a ton increase in slab zinc and another company announced higher prices for iron ore. There were also some advances on extra charges for hot-rolled sheet and strip steel and there are likely to be similar increases on other materials.

However, the big question on prices will not be settled until Spring when labor contracts in major industries are settled. The industrial price curve, which has jumped after previous wage increases, is expected to reflect the next round. But, with increases likely to be smaller this time and not so widely spread, plus a growing competitive pressure, industrial prices probably will not be affected sharply. Where demand is heavy, producers may be able to pass on to customers some of their increased costs, but this will not be possible in many industries.

Builders Optimistic

The machine tool industry began 1949 with a spotty sales record. Prospective buying is considerably larger in volume than actual purchases. But evidence is piling up that the sales total and production this year should measure up well compared with last year, and probably will run ahead of the 1948 figures.

Foreign demand, particularly from ECA countries, is showing signs of recovery. And tooling programs for jet engines appear to be nearer the buying stage.

Seasonal Lay-offs Felt

Scattered lay-offs show many businesses are returning to the prewar seasonal pattern. Employment dropped during December from the November mark. Non-agricultural employment, which usually rises in the final two months of the year, held level.

Looking ahead at manpower, employment should continue high. For one thing, demands of the military and foreign relief programs on industry will be higher in the first half of this year than they were in 1948. But, with seasonal patterns emerging in many industries again, manpower may not be as tight as it has been several times since the war.

Handling Equipment Up

Materials handling equipment has grown to almost a $300-million-a-year business. With a total volume of about $290 million in 1948, the industry did 2.6 times as much business as in 1949. That pattern of growth about matches the general increase in capital goods industries over the past 10 years.

Steel Supply Tight

Allocations and foreign aid programs, plus heavy domestic demand, will continue to keep steel in short supply, but signs that a turning point may come during 1949 are seen.

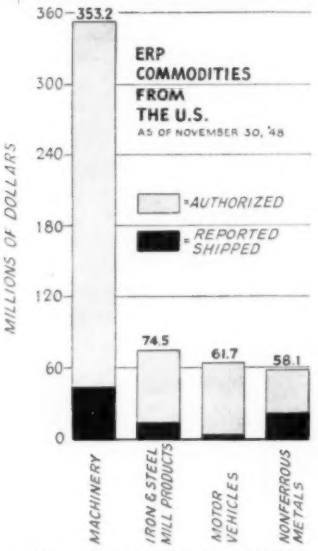
The gradual dwindling of gray-market trading and a drop in the price of scrap indicate that the steel market is slowly approaching a semblance of balance.

Some warehouses report that manufacturers are not taking as readily sheet and strip which do not fill specifications for a specific product. Recent practice has been for users to alter products and tools to take steel which did not fit size standards set up by design rooms.

Switches to the lighter metals have also helped the steel situation to some degree and, if production of these metals is stepped up soon

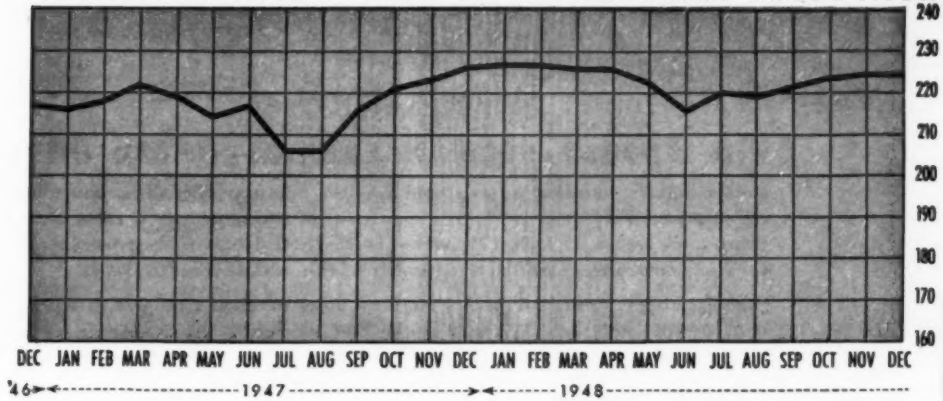
Foreign Orders Far Behind Authorizations

ERP authorizations far exceed orders placed for machinery, iron and steel mill products, motor vehicles and non-ferrous metals. During this year the impact of the foreign-aid program will be felt by manufacturers in increased orders.



SOURCE: DIVISION OF STATISTICS & REPORTS ECONOMIC COOPERATION ADMINISTRATION

American Machinist INDEX OF METALWORKING PRODUCTION



INDEX		COMPONENTS				
		MACHINERY	ELECTRICAL MFG.	AUTOS, TRUCKS	TRANS-PORTATION EQUIP.	OTHER METAL-WORKING
Dec. 1948.....	224	249	235	225	309	156
Nov. 1948.....	224	250	236	223	311	159
Dec. 1947.....	226	247	245	235	293	156

AMERICAN MACHINIST'S INDEX OF METALWORKING is based on manhours worked in five segments, which are "weighted" as follows: Machinery, 32.5—Auto & Trucks, 22.6—Electrical Manufacturing, 15.4—Transportation Equipment, 12.4—All Other Metalworking, 17.1 Index figures are a percentage of 1939, which equals 100.

there will more than likely be more changeovers.

Non-Ferrous Markets Firm

The President's request for $525 million for stockpiling and $15 million for incentive payments for exploration and development of minerals left the non-ferrous industry dazed but failed to affect the market to any noticeable extent.

Offerings of lead increased, but supplies were readily absorbed and the price continued firm.

With the strike in Utah still on, the supply situation in copper remains tight and prices firm. Despite a substantial increase in the output of slab zinc in December over November, the market continues strong and prices are unchanged.

Demand for aluminum continues to exceed by a large margin the supply. This situation will not ease until power requirements can be met to increase output in areas now hit by droughts. Even if this is done, the capacity of the industry is not sufficient to fill present requirements. Most aluminum companies will not take new customers and have cut back on quotas to old ones.

Tool, Die Sales Holding

Sales in the tool and die industry during November were 14% ahead of the corresponding month for 1947 and slightly above those in October, 1948. For the first 11 months of 1948, however, sales were about the same as for the corresponding period in the previous year.

During November the work week in the average tool and die shop was shortened. At the same time employment in the industry sagged 4%.

Backlog for the industry at the end of November was off 2% from October, putting most shops on practically a day-by-day basis. Despite the present softening, the industry is well up in billings, as compared to previous months of last year and 1947, indicating there is work to be had and that shops are turning out a considerable amount.

Most shop owners say the outlook is good—that a number of manufacturers of consumer goods, finding present models slowing down, are already at work on new designs, principally for eye-appeal. This trend should result in work for the tool and die industry.

Foundry Orders Off

Malleable foundries have about half the backlog of orders on their books at this time that they had in January, 1948. Companies in the East appear harder hit than the average in the industry.

Shrinkage of the backlog is of little concern, as yet, to most Midwest foundries. They have enough orders on hand to keep them busy for the next four to six months. They believe that customers know orders will be filled quickly and are placing them only as needed.

With demand and supply approaching a balance, some malleable foundries are preparing to go ahead with installation of additional mechanical equipment.

Ordnance Contracts Let

Allison Division, General Motors, has been awarded a $40-million contract by the Army Ordnance Department for mechanical-hydraulic torque-converter-type transmissions for the M46 General Patton tanks.

In the jet-engine field, Solar Aircraft and Ryan Aeronautical have been awarded jet-engine parts contracts by General Electric to be shipped for assembly to GE's Lockland, Ohio, plant.

hob costs reduced 4 times

with BARBER-COLMAN CARBIDE-TIPPED HOBS

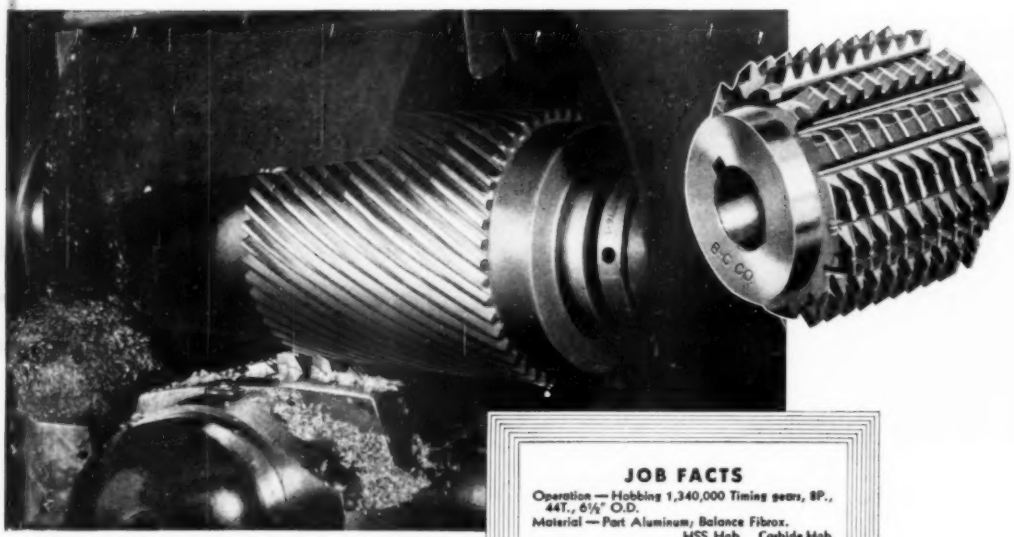
Unfortunately, tool cost in gear hobbing does not stop with the original hob investment. For after the hob is mounted on the machine, it costs something more to use it. Direct labor cost is closely tied-in with feeds and speeds used, resharpening required, and quality of the work produced.

Barber-Colman Carbide-Tipped Hobs have been developed to solve the problem of rapid hob wear in abrasive non-metallic materials. A double saving results from fewer sharpenings and production of more pieces in less time.

Ask Barber-Colman Engineers to submit estimates on either Carbide-Tipped or High-Speed Steel Hobs to meet your production requirements.

Barber-Colman Company

GENERAL OFFICES AND PLANT 315 LOOMIS ST., ROCKFORD, ILLINOIS, U.S.A.



JOB FACTS

Operation — Hobbing 1,340,000 Timing gears, 8P., 44T., 6½" O.D.
Material — Part Aluminum; Balance Fibrox.

	HSS Hob	Carbide Hob
Hob Size	3" x 3-1/4"	6" x 5"
Feed	.66"/min.	6"/min.
Speed	240 RPM	800 RPM
Fl.-to-Fl.	1-2/3 min.	1/3 min.
Hob Cost	$1625.00	$1007.00
Sharp. Cost	3780.00	310.00
Total Tool Cost	$5405.00	$1317.00
Cost Per Gear	$ .00404	$ .00098
Pieces Per Sharp.	1600	67,000

Hob Life — 1 Carbide Hob Equivalent to 28 HSS Hobs.

MODERN MACHINES DEMAND *Modern* CUTTING TOOLS — BARBER COLMAN

American Machinist

MAGAZINE OF METALWORKING PRODUCTION ★ ESTABLISHED 1877

A Necessity, Not A Luxury

Once again stores are advertising clearance sales with sharply reduced prices. And people are rushing to take advantage of them.

Dealers are tempting prospective buyers with automobiles for immediate delivery without trade-ins or unwanted accessories. Liberal allowances are offered for trade-ins if they are part of the transaction.

It has been so long since merchants competed for sales that the public is having a delightful experience. Clerks act again as though they want to be friendly and sell goods.

This return to happier days for the consumer is no cause for joy among manufacturers. They, like their dealers, must begin to sell again.

They must do more than send out salesmen, however, if they expect their volume to hold up. For, painful as the thought is, they again are face to face with price competition. If it isn't upon them, it will be soon enough.

That raises the question put by a large metalworking manufacturer. "How can we cut prices and still absorb another round of wage increases when margins are already lower?"

It is a question hard to answer. Some companies obviously won't be able to do both. Others may, or will have to if they hold onto their share of the market.

In view of the dilemma in which many metalworking companies find themselves, this suggestion is in order:

Management should take a close look at its operating efficiency. Not merely a superficial look, but a very close one.

Inevitably that means a look at production machinery to see whether it is doing the job that it should.

A McGraw-Hill survey shows that many American industrialists already are thinking in terms of this suggestion. Of the dollars to be invested over the next several years, an ever-increasing percentage will be ear-marked for equipment replacement and modernization, in contrast with new plant facilities.

As these industrialists think ahead, they foresee the day when three-fourths of their expenditures will go for replacement of obsolete machinery.

That is an encouraging and healthful sign. For the fact is that industry has been slow to take advantage of the startling improvements in technology designed and built into present-day new machinery.

Now that the pinch of higher labor costs and competitive prices is at hand, production efficiency will count more than ever.

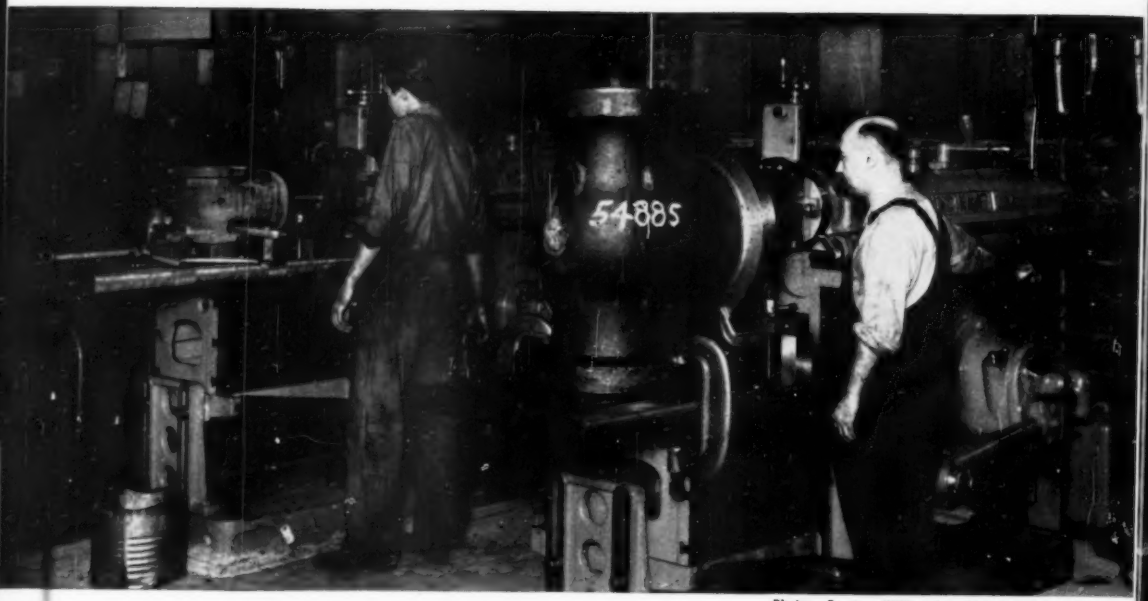
The labor content of products should be reduced. Greater productivity per manhour should be realized, not by working people harder but by automatizing the operation. Higher precision should be built into the new products.

These objectives are not optional. They are imperative if industry is to make a profit and is to prosper.

The return to a buyer's market puts purchase of cost-cutting production machinery into the class of a necessity, not a luxury.

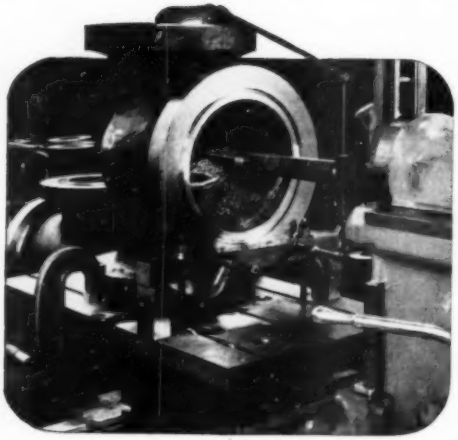
Burnham Finney

EDITOR



Photos—Courtesy William Powell Co., Cincinnati, Ohio

Internal Shaping...



Here is a 32" Cincinnati shaping the guides on a 10" class 600-lb. flanged end gate valve body. Cut length is 16"; feed, .010".

SOLVED THE PROBLEM Internal shaping is the answer to a long list of "hard-to-get-at-jobs." The illustration shows two Cincinnati Shapers of a battery of ten machines shaping both male and female valve guides at the William Powell Company.

MANY SIZES Valves ranging from small 8"—150 lbs. pressure to 30"—2500 lbs. pressure, weighing well over 1000 lbs., are rapidly and efficiently handled.

SIMPLE TOOLING Extension tool holder and high-speed bits cost relatively little. Cincinnati supplementary tables permit rapid setups for the larger valves. Low-cost operation is combined with a high production efficiency.

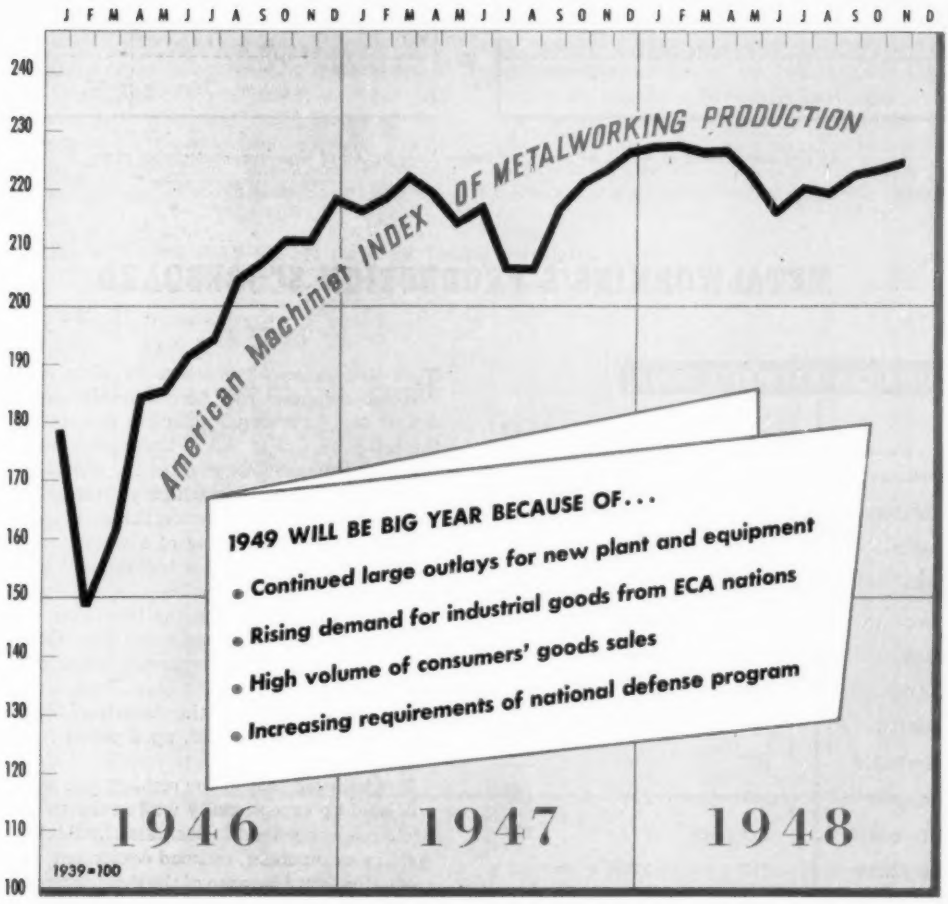
Write for Shaper Catalog N-4 for complete description of Cincinnati Shapers.

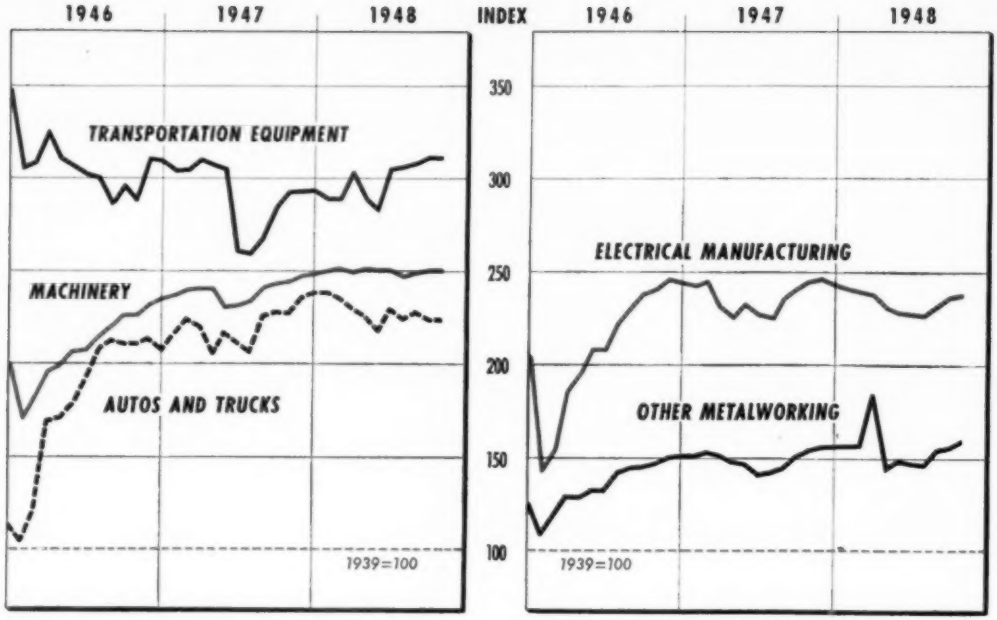
THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO U.S.A.

SHAPERS · SHEARS · BRAKES

1949 WILL BE BIG METALWORKING YEAR





All five components of American Machinist Index have stayed at high level during past year

METALWORKING'S PRODUCTION SCOREBOARD

AMERICAN MACHINIST INDEX:

	1946	1947	1948
JANUARY	178	216	227
FEBRUARY	150	218	227
MARCH	161	222	226
APRIL	184	219	226
MAY	185	214	222
JUNE	191	217	216
JULY	194	206	220
AUGUST	204	206	219
SEPTEMBER	207	216	222
OCTOBER	211	221	223
NOVEMBER	211	223	224
DECEMBER	217	226	

THE five principal divisions of Metalworking which comprise the American Machinist Index of Metalworking Production are charted at the top of this page. All of them were well sustained during the past year, as the charts reveal.

Three of the five—machinery, transportation equipment other than automobiles, and "other metalworking" (consisting of a variety of products) closed the year at a higher level than on January 1, 1948.

The weight attached to the two other components, automobiles and electrical manufacturing, however, brought the combined index down a few notches.

For 1948 as a whole, the American Machinist Index averaged about 223, up 6 points from the preceding year.

It is believed that in the coming year activities will hold up exceptionally well in the two transportation components. Business should be very good in automobiles, railroad equipment and aircraft (the latter because of the defense program).

Large Volume of Metalworking Business Looms in '49

NINETEEN FORTY-NINE promises to be a big year in the metalworking industries. It will be a different kind of good business from that which has prevailed the past few years. It will be more like a good year in the 1920's than like 1947.

Prospects for 1949 in Metalworking look bright for these main reasons:

1. Industry plans to buy almost as much new plant and equipment this year as last. For details, see page 113 on capital expenditures.

2. Industrial equipment makers can expect a rise in orders from Europe under the Marshall Plan. The present ratio of ECA allocations of 60% for industrial goods is almost sure to continue. Over-all, exports reached their postwar low in mid-1948 and will maintain their last year's volume in 1949, and may increase it.

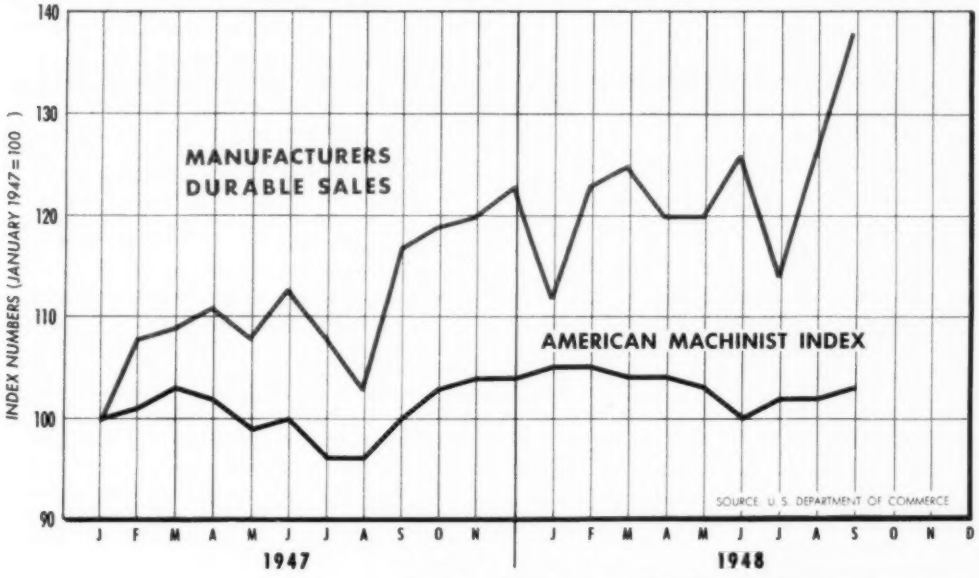
3. Demand for metal consumer goods should be strong throughout the coming year. Purchasing power still is at an all-time high. Just because a buyers' market has appeared is no reason to believe that retail purchases will decline perilously. The automobile industry, for one, expects to make and sell as many units this year as last, when 5.28 million units were produced. It may even exceed that figure.

Some major appliances probably will not be able to keep up the 1948 pace. But their losses will be offset by new products, like television and dishwashing machines.

4. Production in many heavy-equipment lines should be large this year. The railroad equipment field is an example. American Locomotive Co. went into 1949 with unfilled orders of $110 million. Electro-Motive Corp. and Baldwin Locomotive are known to have huge backlogs.

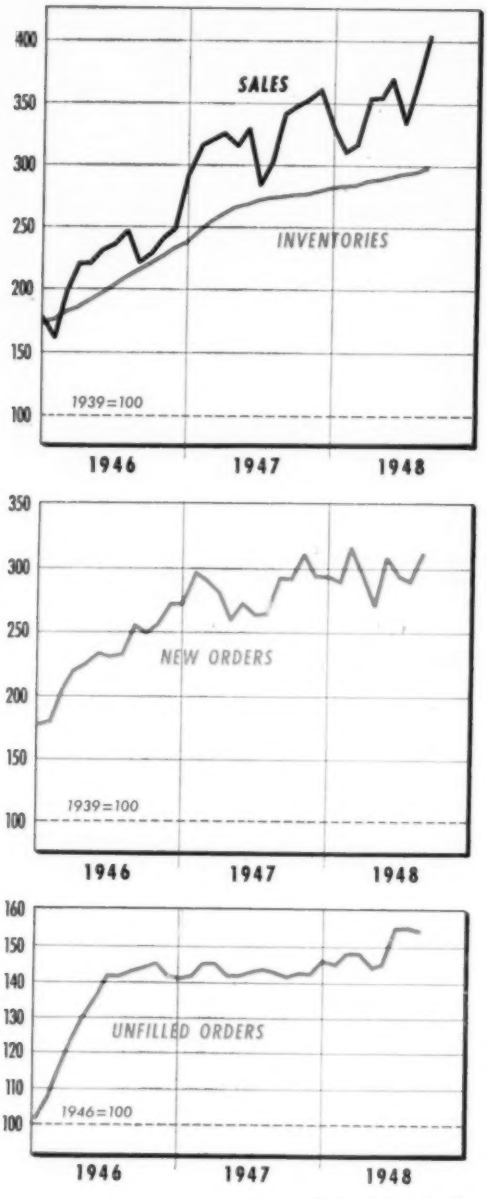
5. National defense program will stimulate operations in the aircraft and allied industries in particular. If any form of military lend-lease for western Europe should be adopted, the defense

DOLLARVOLUME HAS RISEN FASTER THAN PRODUCTION



As prices of goods rose in 1948, the curve of manufacturers durable sales went up. Production (American Machinist Index) remained steady

WHAT'S HAPPENING IN DURABLE GOODS



SOURCE: U. S. DEPARTMENT OF COMMERCE

Dollar volume of sales gained faster than inventories in 1948. New orders meanwhile came in faster than backlogs were worked off. Thus the volume of unfilled orders also climbed

program will have a still greater impact upon metalworking manufacturers.

Steel will continue short in 1949. But the tightness will not be uniform in all steel items. There are signs of an easing in some products at the same time that other items are getting worse.

White House pressure upon the steel industry is likely to result in voluntary allocations on a broader scale; and that may have a disrupting effect upon certain items, particularly plate.

Increasing defense needs and stockpiling by the government will put great pressure on non-ferrous metals, especially copper. For further details on non-ferrous products, see page 121.

Fourth-round wage increases are in the cards for most metalworking industries. Chances are that the fourth round will be smaller than the third and not as broadly adopted. So-called fringe issues and the fact that a drop in business makes it impossible for some firms to afford much of a fourth round will result in this round being a spotty affair.

Prices are likely to rise a very modest amount in producers' goods to compensate for increased labor costs. But a drop in farm and other consumers' goods prices may be an offset, with the general price level staying close to its present position.

Inventories in many lines continued to rise throughout 1948. But manufacturers in Metalworking were becoming more conservative as the year went along. Caution will be the watchword in 1949.

New orders rose faster than sales in some metalworking products the past year, but this advantage began to fade rapidly toward the year-end. Even in the automobile business, a buyers' market is almost here.

Money is becoming tighter and collections slower. The Federal Reserve Board's restoration of near wartime credit controls has acted as a brake upon sales in such items as major appliances and used cars.

This is a year in which government action may have a profound influence upon the metalworking industries, as upon all industry. If the "cold war" pressure should increase and defense and foreign-aid budgets be expanded several billion dollars, beyond present plans, another round of inflation could be set off. Government action could work the other way, too. If government spending should rise only slightly, and business taxes increase sharply, capital expenditures would shrink.

But unless unforeseen factors make themselves felt, 1949 looks like a big year for Metalworking —but managements will have to work hard to make it that.

Industry Plans $14 Billion Investment In New Plant and Equipment This Year

WHAT are industry's plans for capital expenditures in 1949?

How big is industry's backlogs of needs for new plants and new equipment?

An unprecedented survey by the McGraw-Hill Department of Economics throws new light on these questions. Summarizing the plans of responsible industrial leaders across the nation, this survey provides an important measure of industry's requirements for capital facilities.

The survey shows:

1. Industry—the manufacturing, mining, transportation, and utility companies of America—is now planning to invest $14.1 billion in 1949. That is only 5% less than the record-breaking total spent in 1948. Since actual spending usually exceeds plans, the total may be larger in 1949 than in 1948.

2. Industry now has plans to invest $40 billion in the four years 1950-53. Plans taper off, of course, as they are pushed farther into the future. But the decline is remarkably small. In fact, plans for these four years, even when adjusted for price increases, are two-thirds larger than the amounts actually spent in the prewar years 1936-40.

This is not a forecast of what industry will actually spend over the next five years. McGraw-Hill survey results are, rather, a report of the plans leading companies now have to invest in new facilities if a high level of prosperity continues. Whether these plans can be carried through depends on a wide range of political and economic developments that cannot be predicted.

The survey, nevertheless, sheds much light on the potentialities of business. Major findings are:

1. Manufacturing industries alone plan to spend $7.2 billion for new plants and equipment in 1949. This is about 7.5% of the estimated value —$96 billion—of all manufacturing facilities at today's prices.

2. Postwar expansion programs are virtually complete in most manufacturing lines. Major exceptions: steel and petroleum refining.

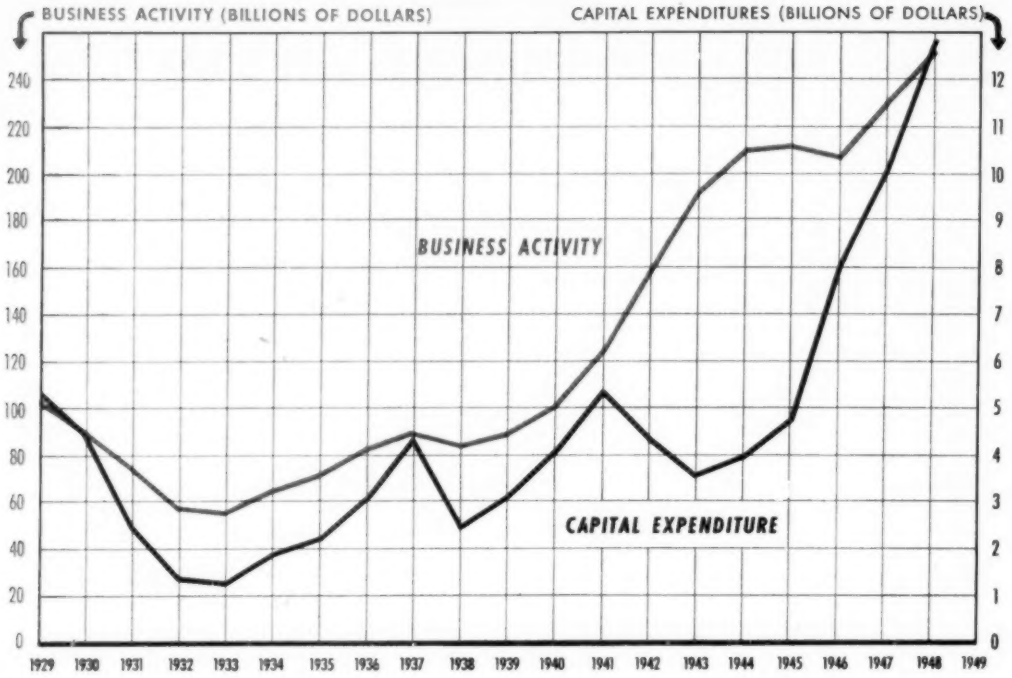
WHAT INDUSTRY PLANS TO SPEND DURING NEXT FIVE YEARS

(Figures in Millions of Dollars)

	1948	1949	1950	1951	1952	1953
Total Manufacturing	8,160	7,200	6,210	5,395	4,975	4,850
Machinery	900	650	620	650	600	580
Electrical Machinery	310	220	160	150	140	130
Autos	630	570	510	500	500	500
Transportation Equipment	135	165	130	90	70	60
Steel	685	600	490	400	345	330
Chemicals	1,400	1,220	1,310	1,210	1,120	1,100
Petroleum Refining	740	720	680	550	520	500
Food	595	525	535	515	370	340
Other Manufacturing	2,765	2,530	1,775	1,330	1,310	1,310
Railroads	1,345	1,520	1,000	880	900	890
Electric Utilities*	1,800	2,050	1,830	1,620	1,630	1,560
Gas Utilities†	880	820	665	580	395	Not Available
Other Transportation & Communications	1,900	1,780	1,525	1,395	1,210	1,180
Mining	765	750	740	590	520	515
GRAND TOTAL	14,850	14,130	11,970	10,460	9,630	8,995

*ELECTRICAL WORLD SURVEY †AMERICAN GAS ASSOCIATION SURVEY

AS CAPITAL EXPENDITURES GO, SO GOES BUSINESS ACTIVITY



3. The expansion programs of railroads, utilities and oil companies still have two to five years to run.
4. Manufacturing industries have increased their capacity 56% since 1939. Almost one half of that increase came in the last three years. But expansion is slowing down. The increase planned in the next five years is 13%.
5. Today half of all manufacturing companies are operating at 90% of capacity or better, but most of them would like to have capacity which would permit an operating rate 5-10% lower.
6. Manufacturing industries are emphasizing efficiency more and more in planning facilities. Their capital expenditures in 1948 went nearly 50-50 for expansion, and for replacement and modernization. But in the next five years they plan to spend three-quarters of their funds to replace and modernize, only one-quarter for expansion.
7. Equipment should pay for itself in five years or less, say three manufacturing companies out of four. New buildings, say 77%, should pay out in 15 years or less.
8. Profits and depreciation reserves are counted on to pay for new buildings and equipment.

report three out of four manufacturing companies. Some 15% expect to borrow, only 9% plan to sell stock. However, 20% would like to sell stock, only 4% want to borrow.

In showing that industry needs—and plans to put through—a tremendous program of capital improvement in the next five years, the McGraw-Hill survey reveals much about our chances of maintaining prosperity. General prosperity is

COST-CUTTING TO BE MUCH BIGGER FACTOR IN CAPITAL EXPENDITURES

	PERCENT OF FUNDS GOING TO EXPAND CAPACITY		PERCENT OF FUNDS GOING FOR REPLACEMENT AND MODERNIZATION	
	1948	1949-53	1948	1949-53
All Manufacturing	42	26	58	74
Machinery	49	27	51	73
Autos	20	14	80	86
Electrical Machinery	58	37	42	63
Transportation Equipment	46	11	54	89
Steel	3	3	97	97
Petroleum Refining	60	40	40	60
Chemicals	64	50	36	50

geared to industry's investment in new plants and equipment. The record shows that when business investment has fallen off in the past, all business has declined.

Capital expenditures planned for 1949 are large enough to be consistent with continuing high-level business activity. Plans for the years beyond, like 1949 plans, are not a forecast. Actual expenditures in the years beyond 1949 may well be larger than the plans indicate. Projects which are not now anticipated will appear. New products and new processes will be developed. Continuing prosperity would make it possible for industry to expand the plans.

The survey also reveals a great deal about the changing character of investment programs. Postwar expansion programs in Metalworking are virtually complete. As the table shows, metalworking industries are generally tapering off on their investment programs. But such industries as steel, chemicals and petroleum refining, plan to continue at a high level. The utilities and transportation industries also plan large programs.

Metalworking stands out in the survey's findings on how industry has increased its capacity. While manufacturing companies as a whole have expanded their facilities 56% since 1939, capacity in electrical machinery is up 180%, in transportation equipment 150%, in machinery 100%, and in autos 30%. In the five years ahead, electrical machinery makers plan to increase their capacity another 25% and machinery makers 20%. But, for Metalworking generally, the peak of expansion has passed. Emphasis is shifting to improving efficiency, as the table at left shows.

That industry sets high standards before spending its investment dollar is revealed in the survey. Three manufacturing companies out of four expect equipment to earn back its original cost within five years. In metalworking industries, about nine companies in ten expect equipment to pay for itself in five years or less.

Many companies say they can set such high standards because they can spend all the money they have within these limits.

Responsible heads of leading companies across the nation supplied the facts on which this survey is based. Their companies in all employ more than 5 million workers. These include 60% of the workers in the industries which make three-fourths of the total capital expenditures of all industry. Findings on the companies covered were projected to represent industries as a whole.

If industry can get the money to continue buying capital equipment at a high level in 1949—and to carry through the plans made for purchases in years to come—Metalworking's prospects will be strongly reinforced.

HOW SOON MUST EQUIPMENT PAY FOR ITSELF?

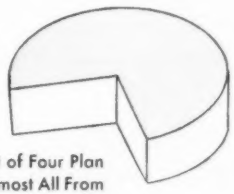
It Should Not Take Longer Than 5 Years, Say Majority

	Percent of Companies Saying:			
	2 YEARS OR LESS	3 YEARS OR LESS	5 YEARS OR LESS	10 YEARS OR LESS
Machinery	13	38	85	100
Electrical Machinery	11	44	89	100
Autos	29	57	72	86
Transportation Equipment	0	29	100	100
Steel	0	0	80	100
Coal Mining	20	35	65	95
Chemicals	10	20	60	100
Textiles	7	36	57	100

METALWORKING OUTSTRIPS OTHER INDUSTRIES IN EXPANDING ITS PRODUCTIVE FACILITIES

	Percent Increase in Physical Capacity:		
	1939 TO DEC. 1948	JAN. 1946 TO DEC. 1948	NOW PLANNED FOR 1949-53
Machinery	100	30	20
Electrical Machinery	180	60	25
Autos	30	25	10
Transportation Equipment	150	3	5
Steel	15	3	3
Petroleum Refining	60	30	25
All Manufacturing	56	19	13

WHERE THE MONEY COMES FROM

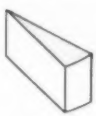


Three out of Four Plan to Get Almost All From Profits and Reserves

Only 9% Plan To Sell Stock . . .

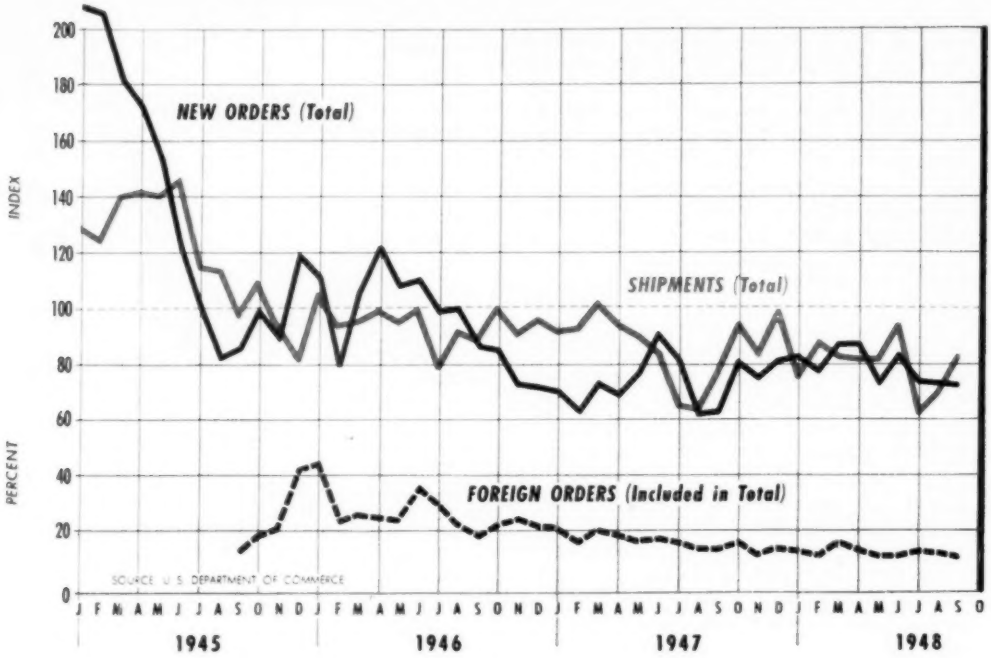
. . . And 15% Expect to Borrow

BUT . . . 20% Would Like To Issue Stock . . .



. . . And Only 4% Want to Borrow

What's Happened in Machine Tools



Machine tool shipments in 1948 fell slightly under the 1947 total. Backlogs slipped too. Outlook is for same volume, or a little better, this year

NEW ORDERS AND SHIPMENTS OF MACHINE TOOLS

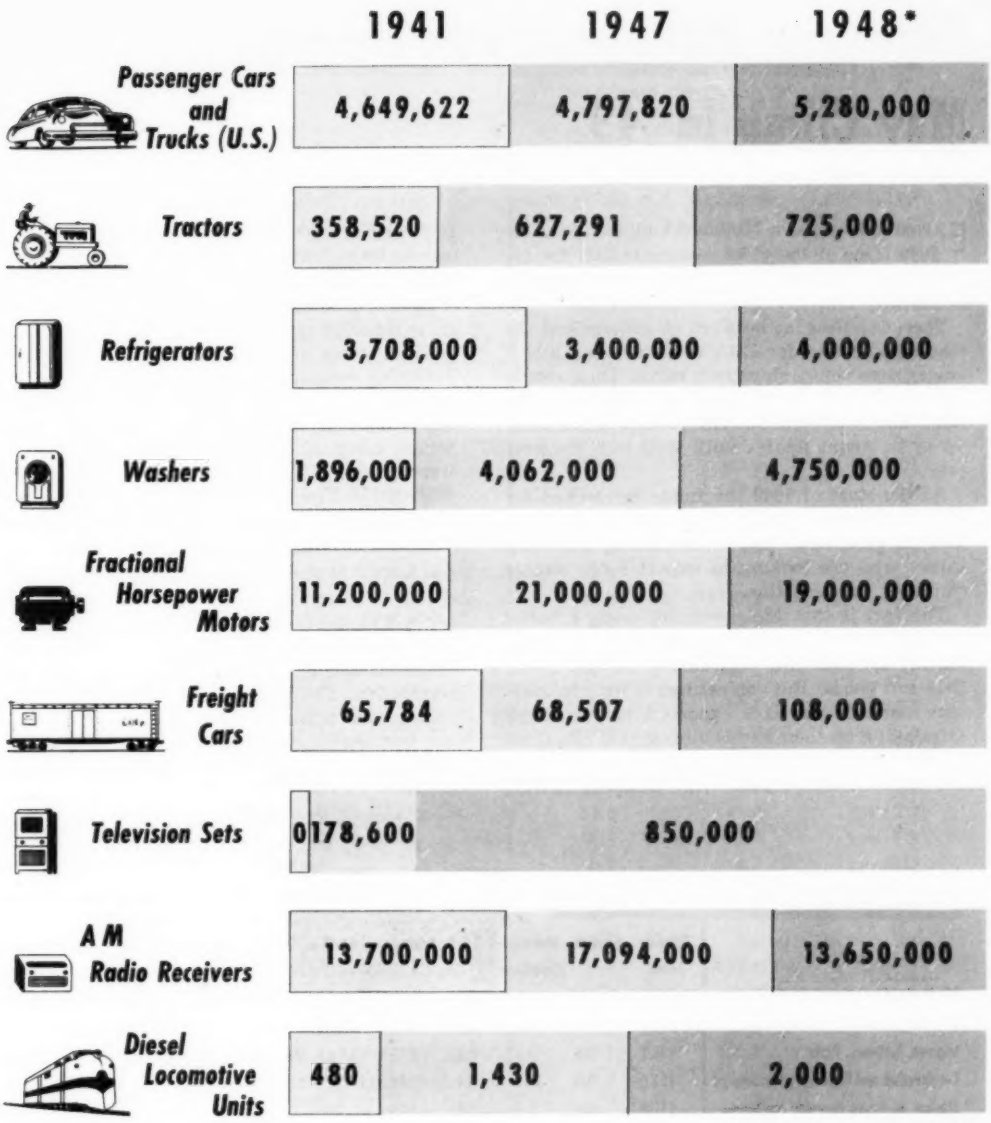
DATE	NEW ORDERS (Total)	FOREIGN ORDERS (Included in Total)	SHIPMENTS (Total)
1945			
JANUARY	208.9		130.0
FEBRUARY	205.4	NOT	125.9
MARCH	181.8		140.4
APRIL	172.4		142.6
MAY	154.8		140.5
JUNE	123.3		146.0
JULY	100.3	AVAILABLE	115.4
AUGUST	83.1		113.1
SEPTEMBER	85.8	13.1	96.3
OCTOBER	99.3	18.4	109.5
NOVEMBER	89.1	20.5	91.6
DECEMBER	119.4	42.4	81.7
1946			
JANUARY	115.6	44.3	105.9
FEBRUARY	79.8	24.0	94.2
MARCH	106.3	26.8	95.2
APRIL	123.4	25.3	99.0
MAY	107.9	24.1	94.2
JUNE	109.1	35.7	99.8
JULY	99.0	29.3	78.3
AUGUST	99.9	22.4	92.5
SEPTEMBER	86.4	18.3	87.5
OCTOBER	85.3	22.1	99.9
NOVEMBER	73.2	24.5	90.4
DECEMBER	72.7	21.8	95.2

DATE	NEW ORDERS (Total)	FOREIGN ORDERS (Included in Total)	SHIPMENTS (Total)
1947			
JANUARY	71.7	21.0	91.7
FEBRUARY	63.8	15.8	92.4
MARCH	74.3	20.1	100.4
APRIL	69.8	18.8	93.3
MAY	76.9	16.3	89.2
JUNE	90.9	17.2	84.1
JULY	81.1	16.7	65.2
AUGUST	62.1	14.6	63.6
SEPTEMBER	63.7	14.7	77.0
OCTOBER	81.0	16.0	94.8
NOVEMBER	75.6	11.5	84.7
DECEMBER	81.1	14.8	98.4
1948			
JANUARY	83.1	14.0	75.3
FEBRUARY	77.3	12.7	87.1
MARCH	86.3	16.1	83.6
APRIL	86.3	14.1	82.0
MAY	73.5	11.4	82.6
JUNE	83.4	11.9	94.4
JULY	74.0	13.3	62.4
AUGUST	73.7	13.6	69.8
SEPTEMBER	p 73.1	p 11.6	p 84.7

BASE—AVERAGE SHIPMENTS 1946-1946-1947 = 100%

p—PRELIMINARY FIGURES

N.M.T.B.A. OCTOBER, 1948



*ESTIMATED FROM 9 MONTHS TOTAL

MANY PRODUCTS MADE BIG GAINS IN '48

MANY consumer goods chalked up sensational production records last year. Automobiles, refrigerators and washing machines were typical examples. Television sets rose from a meager 178,600 units to 850,000. Radio receiving sets, as a result, suffered somewhat.

But the gains were not confined to consumer goods. They spread to heavy goods, too; witness the performance in tractors and freight cars. More diesel locomotives were built than ever before.

The outlook in all of the items listed on this page, typical of metal products as a whole, is very bright. The automotive and tractor people expect to do at least as well this year as last.

Exports of Metalworking Products May Climb in '49

EXPORT prospects in Metalworking are good for 1949. One of the chief reasons is that the effects of the Marshall Plan are just now beginning to be fully felt.

There is a time lag between allocations and the placing of orders for ECA countries, and a still longer time before shipments move. Thus, recent increases in the percentage of Marshall Plan funds allocated for industrial goods will not show up in shipment figures until well into the new year.

At the start of 1949 the funds earmarked for industrial goods had risen to 60% of the total. That is good news for metalworking manufacturers who are looking to export for a sizable chunk of business this year.

The fact is that Metalworking made a better showing in exports than industry as a whole during the past year. Durable goods did better than soft goods. But competition is back in overseas markets; and U.S. exporters have a tough sales battle on their hands during 1949. To illustrate the point: American machine tool builders are now in competition with those of Britain (who are strongly backed by their Labor government), Italy, Switzerland, Belgium, France and Sweden. Shortage of dollars, much lower prices of European machines and desire of foreign buyers to conserve their dollars for things other than machine tools are making it rough going for American companies.

Exports as a whole appear to be headed upward this year. Marshall Plan purchases, more dollars acquired by other nations through increased trade with the United States, and the possibility of getting dollars from other sources add up to a total export trade at least equal to 1948, and probably better.

If Congress should grant any form of military lend-lease, a not unlikely action on its part, exports will climb well above last year's level.

Of all metalworking exports, the largest item in dollars during 1948 was automobiles, parts and accessories. The next largest was electrical machinery and apparatus. Canada continued to be our best customer, with Brazil in second place. Argentina was high on the list, being in third position.

WHERE EXPORTS WENT IN 1948

EXPORTS IN MILLIONS OF DOLLARS DURING FIRST NINE MONTHS OF 1948

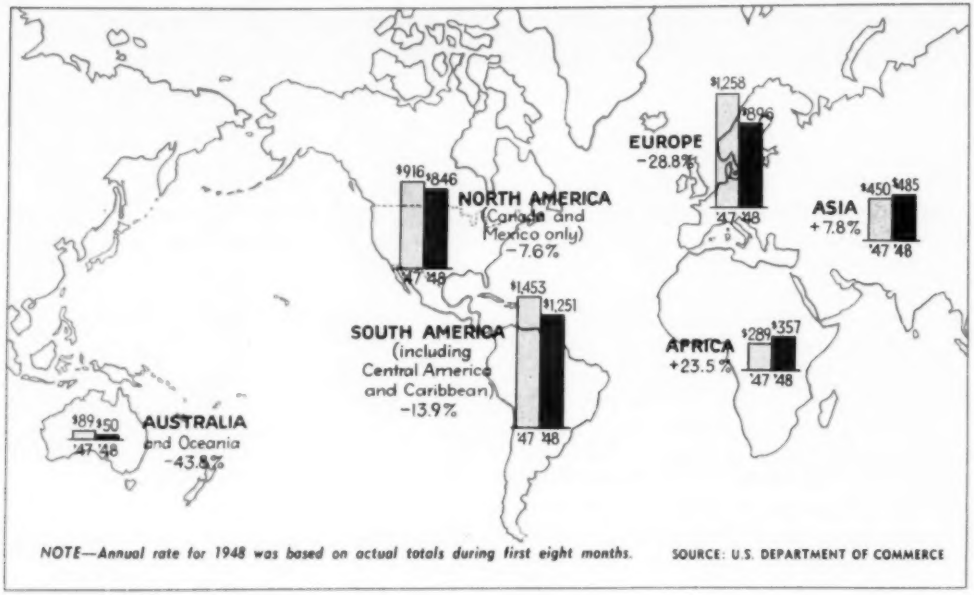
	Grand Total	France	United Kingdom	U.S.S.R.	Canada	Mexico	Brazil	Argentina	Venezuela	China	India
TOTAL MACHINERY AND VEHICLES	$2,573.4	$106.7	$96.1	$22.7	$402.3	$155.4	$191.3	$162.4	$136.4	$36.0	$68.3
Electrical Machinery and Apparatus	342.5	5.2	4.3	4.1	49.7	24.2	32.9	28.8	20.1	4.5	8.1
Engines, Turbines, Parts	135.2	3.6	1.5	0.3	21.6	14.5	10.8	13.5	6.9	4.0	3.9
Construction and Conveying Machinery	133.0	8.6	11.5	5.9	27.9	7.8	6.1	7.3	8.3	0.4	1.2
Mining, Well and Pumping Machinery	117.8	4.5	1.9	3.8	15.3	10.2	2.2	5.0	22.1	1.2	2.4
Metalworking Machinery	105.7	13.3	11.4	4.5	18.1	4.3	4.5	6.0	1.7	1.0	3.2
Textile, Sewing and Shoe Machinery	102.7	3.0	10.2	*	15.9	7.9	9.1	11.7	2.1	4.1	3.1
Other Industrial Machinery	268.4	6.0	14.4	3.6	51.3	20.6	15.3	15.6	13.9	3.6	9.4
Office Machinery	60.8	2.0	6.2	*	7.2	4.3	4.5	3.5	2.2	0.3	2.0
Printing and Bookbinding Machinery	30.1	0.1	1.9	0.1	6.2	1.4	1.7	1.6	0.6	0.7	3.4
Agricultural Machinery and Implements	255.2	14.5	15.8	*	86.2	17.4	5.0	9.6	8.4	0.1	3.6
Autos, Parts and Accessories	632.9	3.2	3.6	0.2	80.6	33.1	76.5	35.7	43.1	1.8	20.3
Aircraft, Parts and Accessories	104.2	8.1	2.5	0.1	6.6	3.9	5.8	8.9	1.5	9.1	5.4
Other Vehicles and Parts	284.9	34.5	10.8	*	15.7	5.7	16.9	15.3	5.5	5.3	2.3

*Less than $100,000. (SOURCE: U. S. DEPT. OF COMMERCE)

METALWORKING EXPORTS FAIL TO HOLD GAINS

	(MILLIONS OF DOLLARS) FIRST EIGHT MONTHS 1947	1948	Percent Change of Monthly Averages 1947 to 1948
TOTAL MACHINERY AND VEHICLES	$4,597.6	$2,573.4	−21.7
ELECTRICAL MACHINERY AND APPARATUS	562.7	342.5	− 8.7
Generators	69.3	39.1	−15.3
Electrical Distribution Equip.	52.7	37.6	+ 9.5
Motors, Starters and Controllers	45.4	38.7	+27.9
Electric Refrigerators and Appliances	139.0	81.2	−12.3
Radio Apparatus	113.7	59.0	−22.2
ENGINES, TURBINES AND PARTS	217.3	135.2	− 6.7
Steam Engines, Boilers and Accessories	29.3	20.7	+ 6.1
Internal Combustion Engines	120.3	75.2	− 6.2
Steam Locomotives and Parts	59.6	28.2	−29.1
CONSTRUCTION AND CONVEYING MACHINERY	201.0	133.0	− 0.7
MINING, WELL AND PUMPING MACHINERY	192.4	117.8	− 8.1
Mining and Quarry Machinery	50.6	34.2	+ 1.4
Well and Refining Machinery	94.4	56.4	−10.4
Pumping Machinery	47.4	27.2	−13.9
METALWORKING MACHINERY	198.8	105.7	−20.2
Machine Tools	130.7	56.9	−34.7
Lathes	32.1	11.3	−47.2
Milling and Gear Cutting Machinery	19.6	10.1	−22.7
Planers and Shapers	4.6	1.9	−38.0
Grinding Machines	21.4	8.5	−40.4
Machine Tool Parts and Equipment	25.3	13.7	−18.8
Other Metalworking Machinery	55.6	41.6	+12.2
Sheet and Plate Metalworking Machinery	18.4	11.3	− 7.9
Forging Machinery and Parts	8.3	4.3	−22.3
Rolling Mill Machinery and Parts	12.8	15.3	+79.3
Foundry Equipment and Parts	4.4	3.1	+ 5.7
Hand Tools	12.5	7.2	−13.6
TEXTILE, SEWING AND SHOE MACHINERY	127.9	102.7	+20.4
OTHER INDUSTRIAL MACHINERY	399.6	268.4	+ 0.8
OFFICE MACHINERY	101.8	60.8	−10.4
PRINTING AND BOOKBINDING MACHINERY	33.1	30.1	+36.4
AGRICULTURAL MACHINERY AND IMPLEMENTS	317.7	255.2	+20.5
Harvesting Machinery	24.7	24.4	+48.2
Tractors and Parts	222.2	174.2	+17.6
AUTOMOBILES, PARTS AND ACCESSORIES	1,146.0	632.9	−17.2
Motor Trucks, Buses, and Chassis	441.7	242.6	−17.6
Passenger Cars and Chassis	335.3	192.4	−13.9
Second-hand Autos, Trucks and Buses	34.0	8.3	−63.4
AIRCRAFT PARTS AND ACCESSORIES	172.1	104.2	− 9.2
OTHER VEHICLES AND PARTS	783.4	284.9	−45.4
Merchant Vessels	625.3	219.8	−47.3
Freight Cars	92.5	10.4	−83.1

SOURCE: U. S. DEPARTMENT OF COMMERCE



METALWORKING EXPORTS DECLINE IN 1948

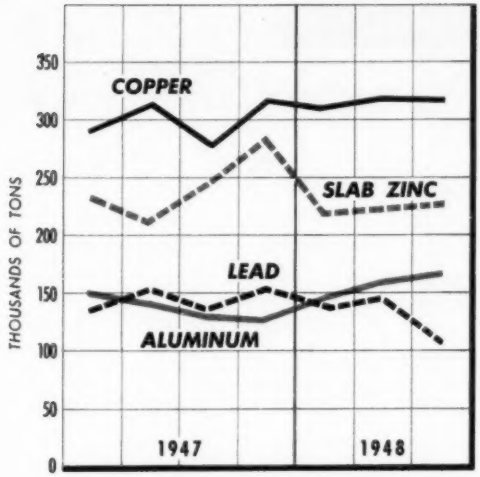
(Figures in Millions of Dollars)

Shipments of metalworking products to Africa and Asia turned upward last year, but fell off to all other parts of the world. Exports to Marshall Plan countries decreased 28.8%

Materials And Components Show Production Gains

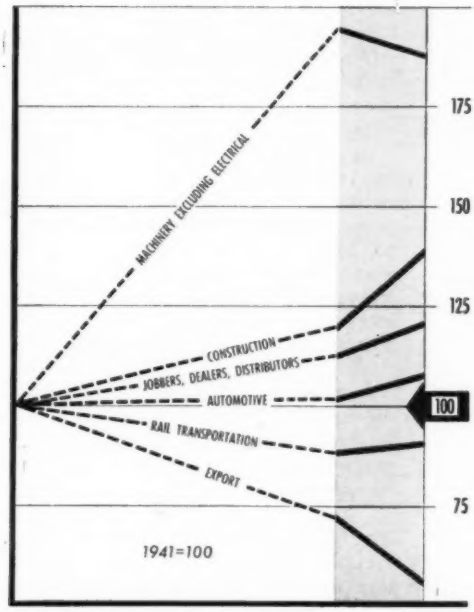
PRODUCT	1947 1st Qtr.	1947 2nd Qtr.	1947 3rd Qtr.	1947 4th Qtr.	1948 1st Qtr.	1948 2nd Qtr.	1948 3rd Qtr.
Pig Iron—Total (thousands of tons)	14,500	14,507	14,055	15,126	14,792	13,687	15,135
Basic (thousands of tons)	11,075	11,219	10,925	11,704	11,581	10,668	11,827
Foundry (thousands of tons)	749	764	765	789	799	746	687
Steel—Total (thousands of short tons)	20,943	21,341	20,341	22,159	22,021	21,046	21,921
Refined Copper (thousands of tons)	290	317	275	315	307	314	313
Lead (thousands of tons)	141	152	139	151	145	148	107
Slab Zinc (thousands of tons)	227	207	242	281	215	218	223
Aluminum (thousands of tons)	150	148	138	135	146	157	161
Castings (thousands of short tons)							
Steel	400	424	375	427	446	447	410
Gray Iron	3,178	3,233	2,890	3,241	3,258	3,116	3,053
Malleable	227	236	198	234	240	238	216
Copper & Copper Base Alloy	144	136	119	131	134	128	120
Zinc & Zinc Base Alloy	62	56	46	55	58	56	53
Aluminum & Aluminum Base Alloy	60	56	48	56	59	54	48
Steel Forgings (thousands of tons)	343	348	299	344	366	342	330
Gears (Mo. Av. Index 1935-1939=100)	321.0	313.8	279.3	339.4	350.3	309.5	334.8

SOURCE: U.S. Bureau of Mines, American Iron & Steel Institute, U.S. Dept. of Commerce, American Gear Manufacturers Association



NON-FERROUS METALS

COPPER and aluminum output rose, slab zinc held steady, and lead fell in 1948. Defense orders put all these metals under heavy demand currently



STEEL

MACHINERY BUILDERS and export customers got less steel in 1948, but jobbers, construction companies, automobile manufacturers and railroad equipment makers got more

Who Is Getting Materials

THOUGH metals production scored a gain in 1948 over the preceding year, the situation remained acute in many lines. Steel was short all year. And voluntary allocations cut severely into the available supplies in certain steel products, notably plates. At the year's end, almost half of plate production was under allocation.

But steel users were not the only sufferers. Aluminum, which it was thought would be in plentiful supply after the war, turned into one of the shortest materials of all. What is worse, the coming year promises only slight if any relief. The situation is likely to deteriorate further before it improves.

Copper is another material which is the cause of deep concern among users. A long strike at one of the chief mines has been of no help. On top of that, the government's stockpiling program has played hob with the domestic supply. This program will not be completed until at least the middle of 1949. Strikes of maritime workers prevented considerable copper from coming into the country from foreign sources late in 1948.

The pattern of steel distribution changed the past year, as shown in the chart on this page and in the table on the next page. Machinery builders and export customers got less steel in 1948 than in 1947. The decline in foreign shipments ran to 21%. Many other consumer industries, however, took more tonnage last year than the preceding year. Construction was the shining example; it increased its steel "take" 13%. Automobile makers got 6% more steel tonnage than in 1947. Jobbers and dealers did all right, too, with a 5% gain.

The explanation for these shifts is not hard to find: government allocations, willingness of some consumers to pay premium prices for "conversion" steel, pressure of demand from long-time big users. The coming year the shifting among consumers is likely to continue. Construction's share may increase further, but not as rapidly as in 1948.

No one can say accurately how long the tightness will hold in materials. It is dependent partly on unknown factors, such as a possible stepping up of the defense effort and of stock-piling, how long the demand will hold for consumer goods, and what attitude users will take toward inventories. But the feeling is that the situation may improve as the year progresses.

STEEL SHIPMENTS TO CONSUMER INDUSTRIES

INDUSTRY	(NET TONS) 1941	1947	(8 Mos.) 1948
1. Steel for converting and processing into . . .			
Wire and Wire products	535,741	859,786	767,899
Other steel products and castings	1,956,853	2,312,023	1,461,798
TOTAL	**2,492,594**	**3,171,809**	**2,229,697**
2. Forgings (other than automotive)	859,191	741,044	560,219
3. Bolts, Nuts, Rivets and Screws	1,160,767	1,293,027	856,760
4. Jobbers, Dealers and Distributors	9,199,811	10,484,144	7,333,908
5. Construction, including Maintenance	5,219,867	6,257,559	4,724,148
6. Contractors products	2,908,021	2,243,399	1,591,450
7. Automotive . . .			
Passenger cars and trucks	6,231,097	5,237,478	3,711,778
Parts, accessories and supplies	2,587,157	3,608,941	2,518,053
Automotive forgings	285,251	426,944	320,782
TOTAL	**9,103,505**	**9,273,363**	**6,550,613**
8. Rail Transportation . . .			
Railroad rails, trackwork and equipment	3,533,866	2,099,319	1,245,689
Freight cars	N.A.	2,181,693	1,742,842
Other	N.A.	598,867	333,447
TOTAL	**5,680,801**	**4,879,879**	**3,321,978**
9. Shipbuilding and Marine equipment	2,733,413	337,961	372,152
10. Aircraft	161,106	39,231	20,447
11. Oil and Gas Drilling	1,735,983	930,731	465,549
12. Mining, Quarrying and Lumbering	249,157	287,670	209,452
13. Agricultural	1,153,678	1,244,548	939,709
14. Machinery, Industrial Equipment and Tools . . .			
General purpose industrial equipment	N.A.	1,264,717	883,620
Tractors	N.A.	447,528	342,775
Hand Tools	N.A.	206,765	113,320
Other	N.A.	1,112,709	618,916
TOTAL	**1,569,712**	**3,031,719**	**1,958,631**
15. Electrical Machinery and Equipment	1,301,275	1,595,520	1,037,220
16. Appliances, Utensils and Cutlery	1,746,810	1,564,722	1,324,142
17. Other Domestic and Commercial Equipment	1,987,569	1,680,259	1,121,444
18. Containers	4,489,410	5,076,170	3,449,666
19. Ordnance and Other Military	1,413,246	56,908	34,255
20. Export	5,888,746	4,206,692	2,202,543
Unclassified	1,429,500	4,660,795	2,584,353
GRAND TOTAL	**62,484,162**	**63,057,150**	**42,888,336**
		Estimate for the year 1948 —	**65,000,000**

SOURCE: AMERICAN IRON AND STEEL INSTITUTE

Gap Narrows Between Wages and Prices

WAGES have gone up faster than prices since the outbreak of World War II. In the manufacturing industries, however, the gap between the two has been narrowing.

It is still wide in a number of individual industries, according to the latest figures. Example: in farm machinery, hourly earnings have increased to 210.9% of the 1939 average; wholesale prices, on the other hand, have risen to 144.5%.

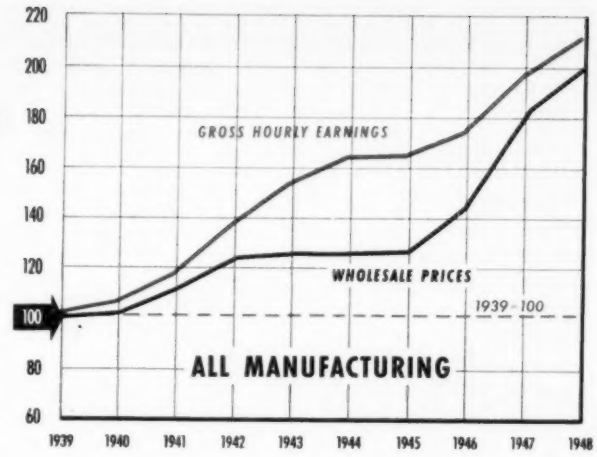
For the manufacturing industries as a whole, wages today are 210.6% of 1939, while prices are 199%.

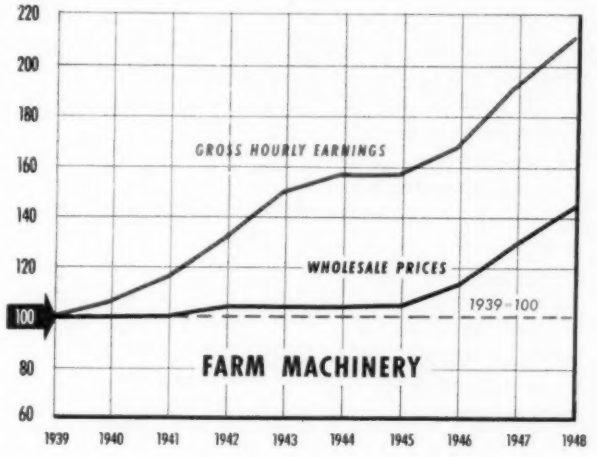
Wage advances in various industries have ranged over a considerable area, as shown in the table on the next page. Biggest increases in the past year (12%) have been in plumbers' supplies, textile machinery, and lighting equipment. The automobile, railroad equipment, cast iron pipe and steel industries are high on the list—11%. Most of the gains were in the 7% to 10% category.

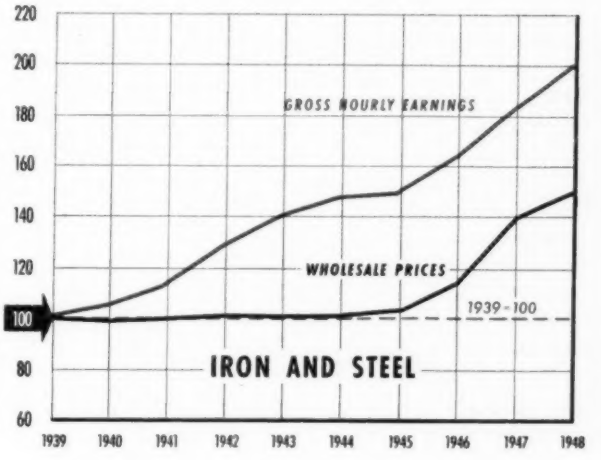
The differences in wage increases since 1941 are striking in various industries. In the automobile industry, for instance, hourly wage rates are up 73% in the eight years. But in textile machinery they have gained 119%. Automobile workers, nevertheless, enjoy hourly rates among the highest in all of industry. The differential which they enjoyed in 1941, however, has been cut down sharply.

Highest wages in dollars and cents being paid in September, 1948, were in the steel mills, iron and steel forging companies, and automobile plants. In all three, the hourly pay was $1.68.

Not far behind the leaders, and almost on a par with them, were manufacturers of locomotives, business machines, and engines and turbines. The lowest average hourly earnings amounted to $1.24—proof that earnings in Metalworking are at a very high level. Average hourly rate in all manufacturing industries was $1.36 last September.







WHAT'S HAPPENED TO WAGES SINCE 1941

INDUSTRY	AVERAGE GROSS HOURLY EARNINGS			Percent Increase	
	Jan. 1941	Sept. 1947	Sept. 1948	Jan. '41 Sept. '48	Sept. '47 Sept. '48
ALL MANUFACTURING INDUSTRIES	68.3¢	124.9¢	136.2¢	99%	9%
Durable Goods	74.9	133.1	145.0	94	9
Nondurable Goods	61.0	116.5	127.1	108	9
Steel Mills	86.9	151.3	168.2	94	11
Gray-iron and semi-steel castings	73.9	137.1	147.3	99	7
Malleable iron castings	70.7	139.0	151.0	114	9
Steel castings	78.0	141.5	153.6	97	9
Cast iron pipe and fittings	62.6	118.4	130.9	109	11
Tin cans and other tinware	63.9	127.5	140.1	119	10
Wirework	71.2	132.3	145.1	104	10
Cutlery and edge tools	65.2	117.1	124.0	90	6
Other small tools	66.2	124.3	135.6	105	9
Hardware	62.1	122.2	132.9	114	9
Plumbers supplies	69.6	131.0	146.6	111	12
Stoves, oil burners, etc.	67.8	130.5	143.8	112	10
Steam and water heating apparatus	73.2	135.2	147.6	102	9
Stamped and enameled ware	66.5	129.7	139.7	110	8
Structural and ornamental metalwork	74.3	134.4	144.8	95	8
Bolts, nuts, washers, rivets	70.6	131.7	145.4	106	10
Forgings, iron and steel	81.8	152.6	168.4	106	10
Firearms	72.2	140.1	149.2	107	6
Electrical Equipment	76.5	136.0	149.7	96	10
Radios and Phonographs	63.2	118.2	127.8	102	8
Communications equipment	78.4	133.5	142.6	82	7
Machinery and machine products	77.7	137.0	148.9	92	9
Engines and turbines	82.7	149.4	163.8	98	10
Tractors	86.8	145.0	157.8	82	9
Farm machinery, excluding tractors	75.7	141.7	154.3	104	9
Machine tools	79.7	140.5	150.0	88	7
Machine-tool accessories	75.8	148.6	156.5	106	5
Textile machinery	67.7	132.9	148.3	119	12
Typewriters	67.5	128.0	131.6	95	3
Other business machines	84.6	151.3	164.6	95	9
Locomotives	81.4	156.7	167.1	105	7
Railroad cars	76.8	137.8	153.6	100	11
Air frames and parts	77.6	138.6	151.2	95	9
Aircraft engines	89.2	146.0	160.9	80	10
Ships and Boats	89.3	146.2	159.4	78	9
Automobiles	96.9	151.5	168.1	73	11
Aluminum	78.2	128.7	142.8	83	11
Clocks and watches	61.4	116.0	125.9	105	9
Jewelry	66.4	120.4	129.1	94	7
Silverware and plated ware	66.6	132.1	139.0	109	5
Lighting equipment	71.7	130.4	146.3	104	12

SOURCE: BUREAU OF LABOR STATISTICS

AMERICAN MACHINIST

36th ANNUAL REVIEW

of

Metalworking Equipment

PARTS AND MATERIALS

A concise, classified review of 1400 new products of interest to the metalworking industries. This equipment, introduced during the past year, is available now to help meet the production problems of 1949

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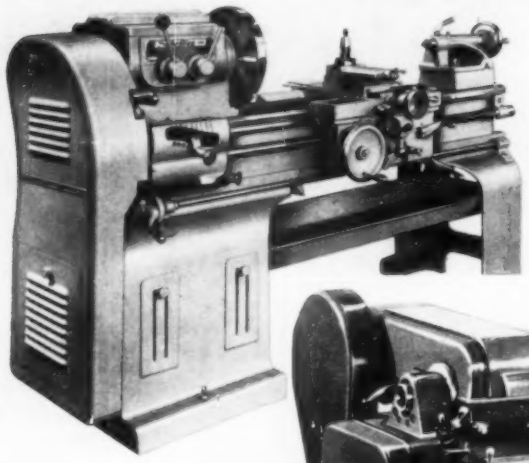
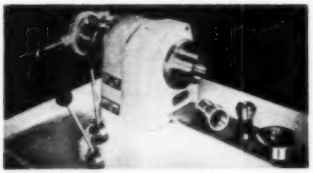
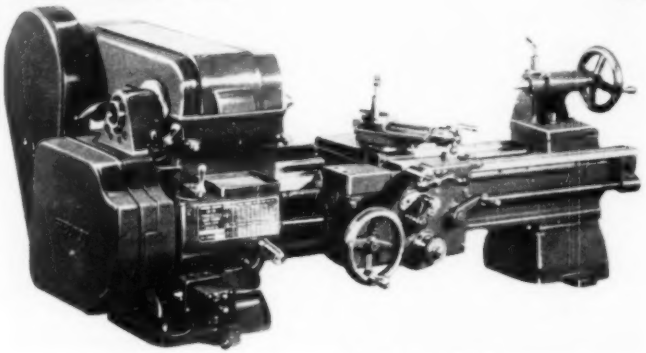


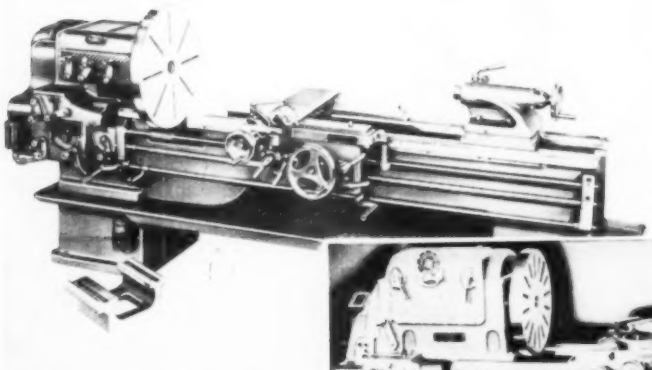
LATHES — *King Machine Tool Div., American Steel Foundries, Cincinnati, Ohio.* Sebastian lathes in general-purpose, clutch-and-brake, and line-shaft-drive types are in 12-in., 16-in., and 20-in. sizes. Gap metric-screw types are in 16-in. and 20-in. sizes.



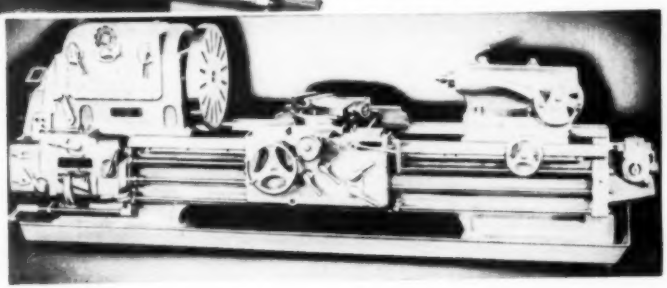
SECOND-OPERATION MACHINE — *Hardinge Brothers, Inc., Elmira, N. Y.* High-speed precision second-operation machine offers a stationary-style collet. The model is known as VBS and combines all the features of their standard model DSM59.



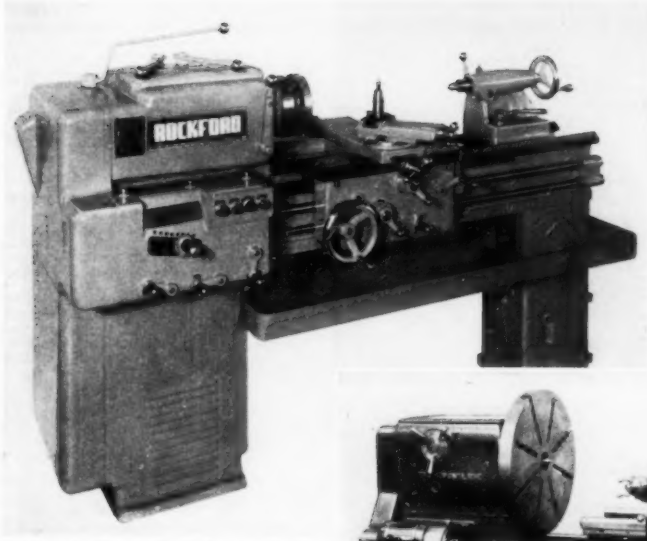
LATHE — *Sheldon Machine Co., 4258 N. Knox Ave., Chicago 41, Ill.* 10-in. bench lathe with a 1 1/16-in. hole through the spindle and an integral horizontal motor drive features a 3/4-in. collet capacity, and a quick-change gear box that gives a thread-cutting range of from 4 to 224 psi.



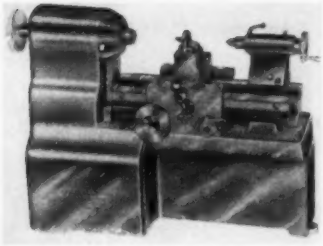
ENGINE LATHE — *Sidney Machine Tool Co., Sidney, Ohio.* Heavy-duty 32-in. engine lathe featuring a 16-speed dial-controlled all herringbone-geared headstock provides 48 changes of threads from 3/4 to 46 tpr. and 48 feed changes from 0.003 to 0.207 in. per rev. of spindle.



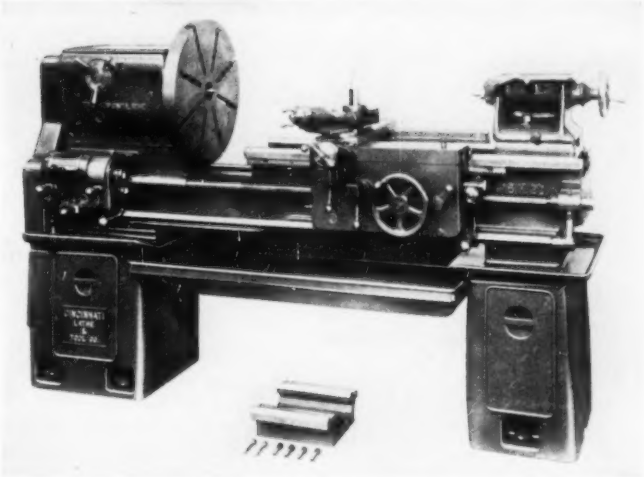
GAP LATHE—*The Sidney Machine Tool Co., Sidney, Ohio.* Gap lathe unit has a 12-speed sliding spur-tooth geared headstock. Lathe is offered in 14-, 16-, 18-, and 20-in. sizes, and is provided with automatic lubrication by a rotary pump and filter. Gear box provides 48 feed and thread changes.



LATHE—*The Rockford Machine Tool Co., Rockford, Ill.* A 14-in. economy lathe, a medium-sized general-purpose lathe has an all-geared headstock with a range of 12 spindle speeds. Overhead design of the headstock permits all types of lathe operations including high spindle speeds and the use of tungsten-carbide cutting tools.

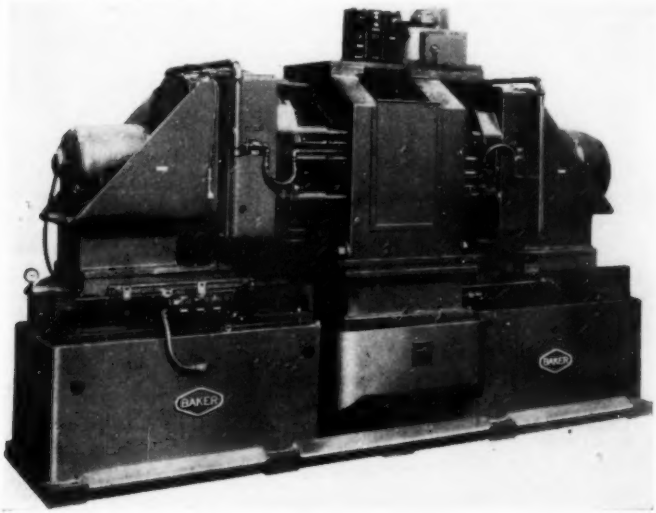


SMALL LATHE—*Small Machines, Inc., West Los Angeles, Calif.* Small lathe listed as the Duo-Lathe, is 10½x 7¼x3¾ in. A self-contained universal motor is mounted in the base. The lathe has a speed range of from 100 to 300 rpm.

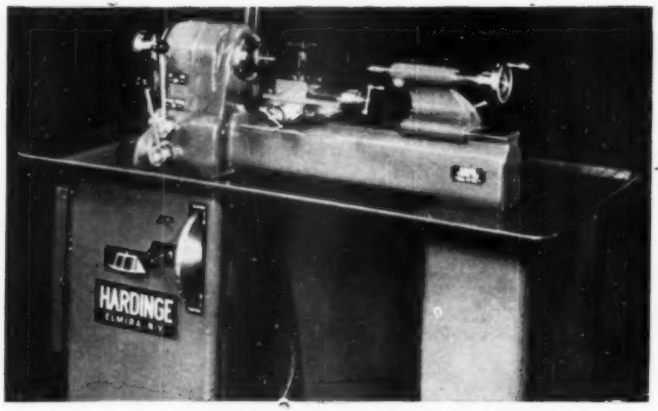


MACHINE—*Baker Bros., Inc., Toledo, Ohio.* Two-way horizontal machine for high-production machining of automobile connecting rods and caps is furnished with a six-station trunnion-type power index fixture arranged to clamp one connecting rod and cap at each station. Two hydraulic-feed saddle units are incorporated.

FIXED-GAP-BED LATHES — Cincinnati Lathe and Tool Co., *Oakley, Cincinnati 9, Ohio.* Series of fixed-gap-bed lathes, called the fixed-gap-bed Cintilathe, is designed for medium- and light-duty engine lathe application. It accommodates large diameters, that do not require the use of a heavy lathe.

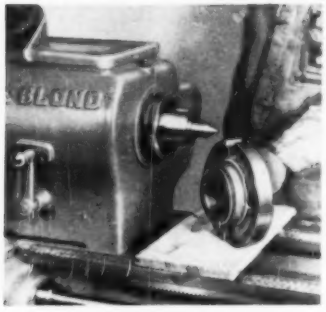


TRUING ATTACHMENT — *Chas. E. Chapin Co., East Rutherford, N. J.* Automatic truing attachment for toolroom and production lathes is said to attain concentricity as low as 0.0001 in. The Auto-Truer is designed for use with universal self-centering chucks, independent chucks, faceplates, and special fixtures.

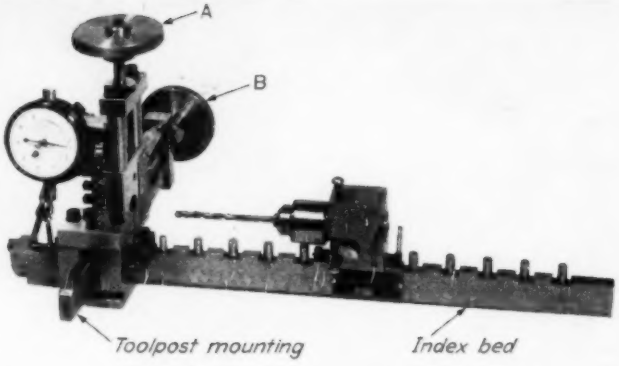


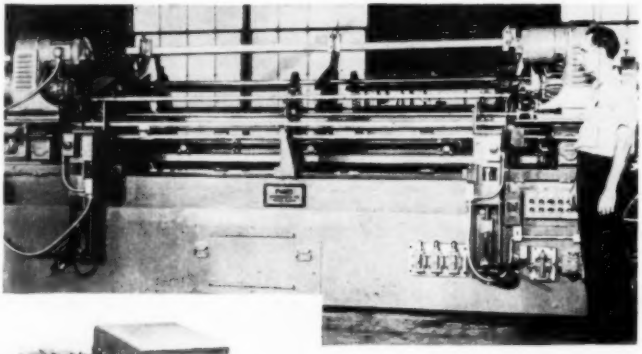
TOOLROOM LATHE — *Hardinge Brothers, Inc., Elmira, N.Y.* High-speed precision lathe with variable-speed drive and free-spindle clutch is designed for working to close tolerances, and finished specifications in toolrooms and laboratories. Headstock has a spindle ground to take 1-in. capacity 5C Hardinge collets, and 6-in. capacity step chucks. Variable-speed drive affords spindle speeds from 90 to 3500 rpm.

LONG, SLENDER WORK STEP-TURNED—*Karge & Son Machine Co., Brockport, N. Y.* There is no length limitation for work that can be turned with various diameters, tapers and forms, with the two types of Turnomats. These devices are essentially a self-contained screw machine that is put in the lathe tool-post or fastened onto the compound so the stock can be driven by power. Accuracy of diameter and length of steps is normally ±0.001 in.

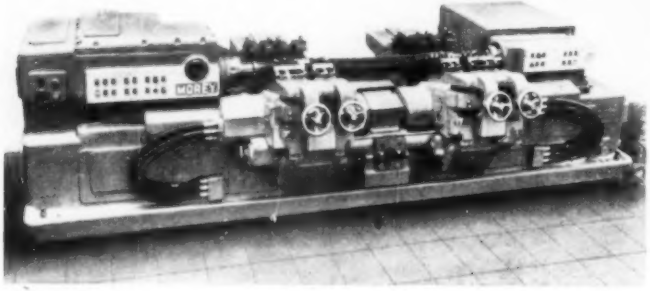


SPINDLE NOSE—*R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio.* The standard taper key-drive spindle nose is now being furnished in place of the threaded type on LeBlond Regal lathes. Tapered chucks and faceplates can now be interchanged among Regals, LeBlond heavy duties, and other types of lathes.

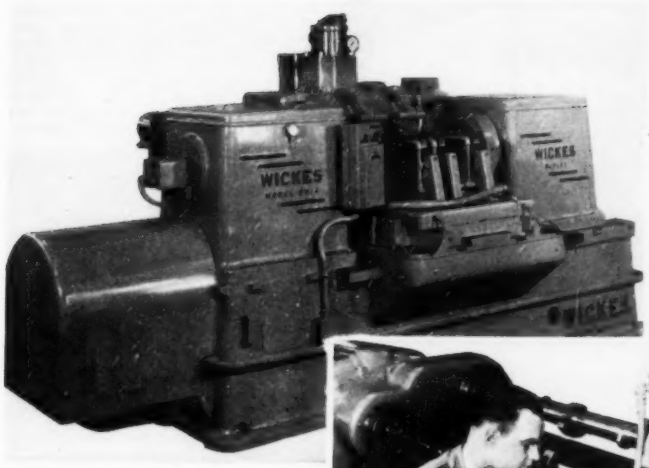




AUTOMATIC LATHES—*Morey Machine Co., Inc., Astoria, N. Y. 2, N. Y.* Railroad-car axles are finish-turned on automatic lathes. The hydraulically-operated lathes are electrically controlled, and use multiple tungsten-carbide tooling. Wheel seat and journal diameters are produced at a rate from 2 to 3 min. each.



PROFILING MACHINES—*Pines Engineering Co., 653 Walnut St., Aurora, Ill.* Automatic profiling machines for high-production end-machining operations are used for turning, boring, chamfering, burring, threading, tapping and other operations on ends of pipe, tubing, bars and similar work. Machine chamfers both ends of ½-in. conduit, 10 in. long, at the rate of 800 to 1000 pieces per hr.

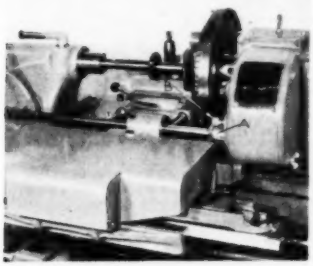


TURNING MACHINE—*Wickes Bros., Saginaw, Mich.* Double-end drive crankshaft turning machine for high-speed operation uses all carbide turning tools. Machine is arranged for rough turning and finish turning the outside diameter of the six counterweights as well as rough turning and finish turning clearance chamfers on the six crankarms, simultaneously. ←

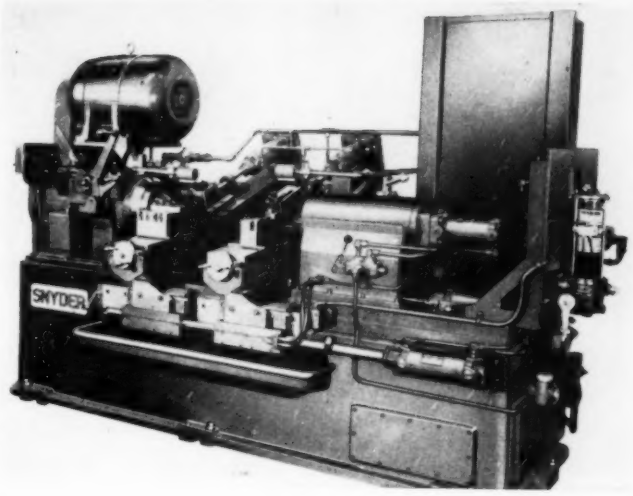
CAM-DUPLICATING LATHE — *The American Tool Works Co., Cincinnati 2, Ohio.* Hydraulic cam-duplicating lathe for reproducing work from a revolving templet by means of a hydraulically controlled cutting tool, is listed as the 20-in. American Pacemaker lathe. Cams are turned from a disk in one cut after which they are ready for the finish-grinding operation. ↓

LATHE—*Skoda Works, Czechoslovakia, marketed by Industrial Operations, Inc., 381 Fourth Ave., New York 16, N.Y.* Heavy-duty lathe, with a feed releasing box attachment is designed to cut time in measuring and checking dimensions. Lathes have a speed range of 1:130 and are said to remove to 250 lb. of chips per hr. One feed releasing box sets length; other, diameter, thus changing the engine lathe to a production lathe. Equipment does not work on a copying principle. Setting is made directly from blueprint.

FACEPLATE ATTACHMENTS—*Superior Mfg. Co., 1302 Ontario St., Cleveland 3, Ohio.* Multi-purpose faceplate and attachment are for conversion of a lathe into a milling machine, boring machine, or drillpress. Regular or odd shapes and sizes can be handled. Bar stock or castings can be drilled, bored, milled or ground.

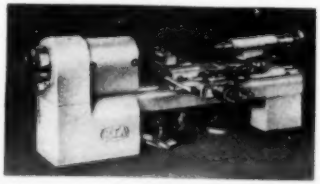


ATTACHMENT—*Sidney Machine Tool Co., Sidney, Ohio.* Universal relieving attachment incorporates 4 to 1 spindle-speed reducer integral with a change-gear, box, thus eliminating the need for two-speed motors.

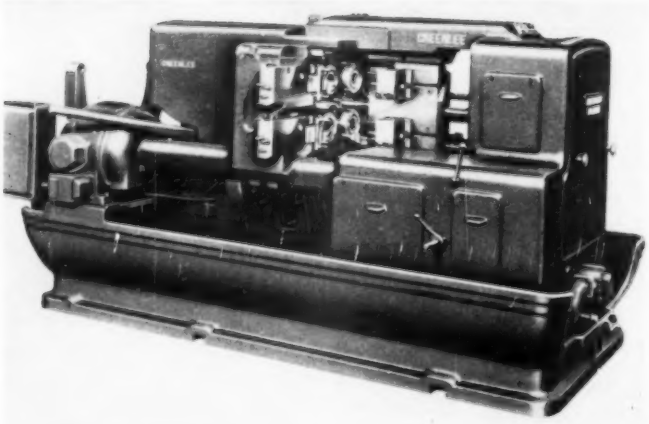


AUTOMATIC LATHE—*Snyder Tool & Engineering Co., 3400 E. Lafayette, Detroit, Mich.* Automatic hydraulic-feed lathe is tooled for turning and facing automotive rear-axle shafts and in one operation finishes all diameters and faces to size, with the exception of grinding stock on bearing and oil-seal diameters. →

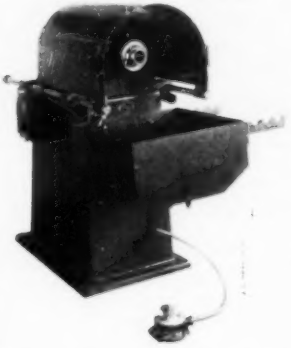
AUTOMATIC SCREW MACHINE—*New Britain-Gridley Machine Div., The New Britain Machine Co., New Britain, Conn.* Six-spindle automatic screw machine, Model 602, handles carbide tooling and has a standard capacity of 2¼ in. The six cross slides are all radial to the center line of the ←spindle carrier and are 60° apart.

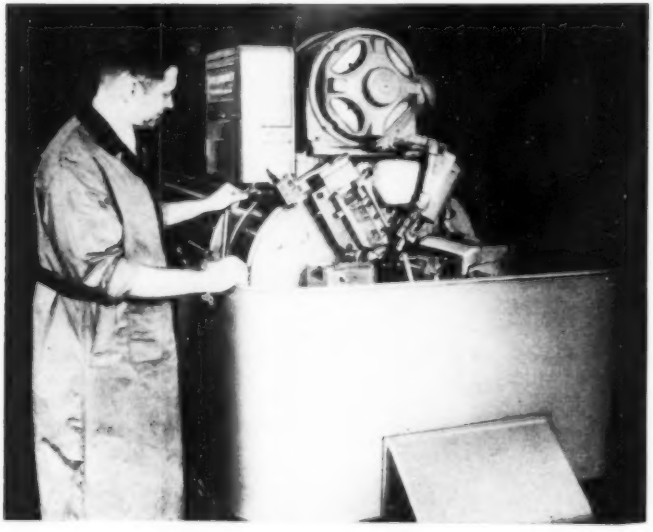


MICRO LATHES—*Lorber Export Import & Purchasing Co., 475 Fifth Ave., New York 17, N. Y.* Pultra Micro lathes are available in 22 standard combinations. The lathe has a 4-in. swing over bed with a maximum center distance of 7 in. between headstock and tailstock, and a maximum standard spindle speed of 6000 rpm.



4-SPINDLE AUTOMATIC—*Greenlee Bros. & Co., Rockford, Ill.* Revised 2⅝-in., 4-spindle automatic screw machine adds an overarm which increases the rigidity of the spindle-carrier housing, and permits the use of heavier tooling. The automatic will handle ←work to 8 3/16 in. in length.





LATHE—*Schauer Machine Co., 2067 Reading Road, Cincinnati, Ohio.* Variable-speed lathe, Type VA4BC-A is used for polishing, deburring or finishing large, round parts. The part is held on the spindle by means of a chuck, faceplate or special fixture, and is revolved during the finishing operation.

LATHES—*The Schauer Machine Co., 2067 Reading Rd., Cincinnati, Ohio.* Group of vertical-spindle variable-speed lathes is designed for general finishing operations. Workpiece is revolved in a horizontal plane. Lathes are available for either manual or air operation, and take various types of holding devices.

SINGLE-SPINDLE AUTOMATIC MACHINE—*The National Acme Co., 170 E. 131st St., Cleveland 8, Ohio.* SST single-spindle automatic is for the manufacture of parts from tubing. The three sizes available are 2, 3, and 6 in. The machine is suited to fast and accurate output on parts made from tubing having relatively few opera-←tions.

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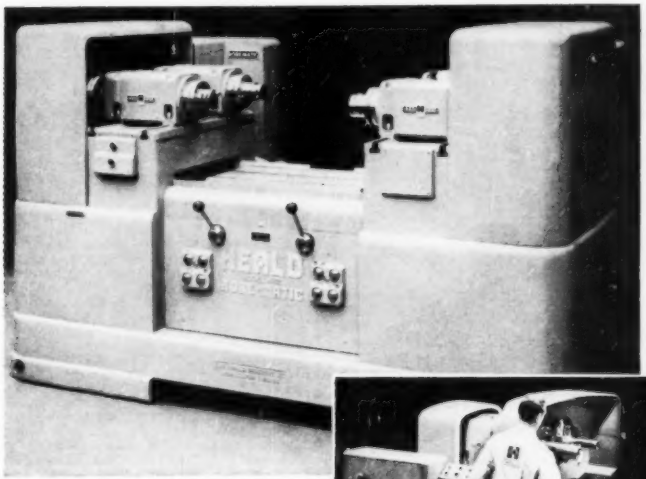
Boring

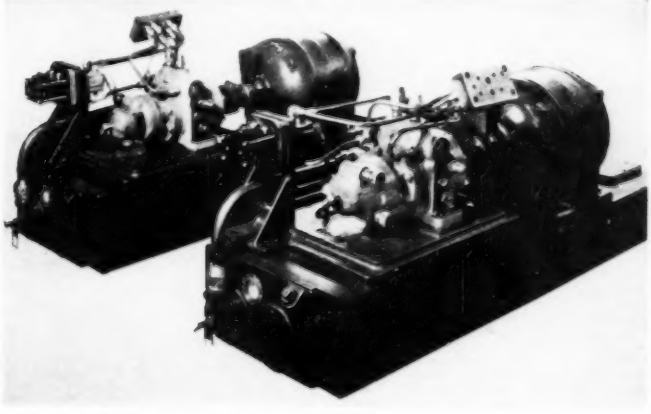


BORE-MATICS — *Heald Machine Co., Worcester 6, Mass.* Two Bore-Matics, Models 421 and 422, handle heavy work without special out-size equipment. Machines perform boring, turning, chamfering, grooving, facing or fly-cutting operations separately or in any combination. Single-end Model 421 and double-end, Model 422, have to 10 hp. available at each end of machine.

BORING MACHINE — *Simplex Machine Tools Div., Stokerunit Corp., 4548 W. Mitchell St., Milwaukee 14, Wis.* Self-contained hydraulic systems with all piping carried to one centralized manifold plate are featured for Simplex 2U 2-way boring machine.

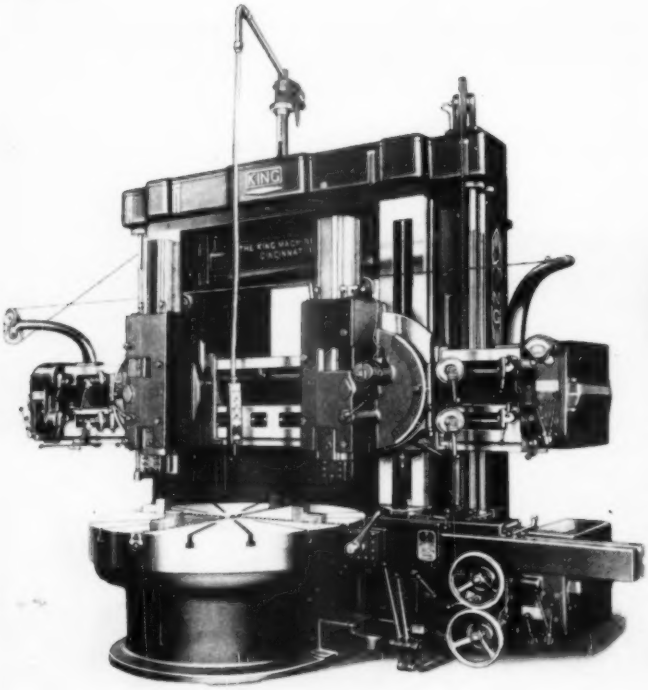
JIG-BORING MACHINE — *Hauser Machine Tool Corp., Manhasset, N. Y.* No. 4 jig-boring machine with 24x 16-in. capacity, has a maximum drilling capacity of 1¼ in.; maximum boring capacity is 6 in. Direct readings on verniers can be had to 0.0001 in. Accuracy of slide location is 0.0002 in. Range of the nine spindle speeds is from 68 to 2000 rpm.

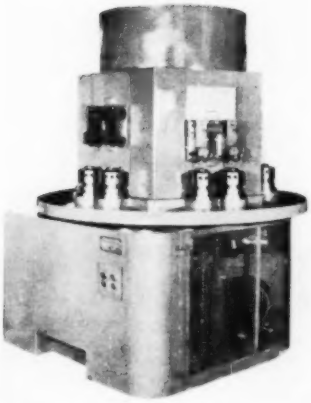
BORE-MATICS—*The Heald Machine Co., Worcester, Mass.* Series of Bore-Matics is designed for precision boring, facing, turning, chamfering or grooving on large, heavy work such as workheads, tailstocks, cylinder blocks, and connecting rods. Models 521 and 522 are standard single- and double-end machines respectively, the Model 524 being the single-end type with a long base for extra-capacity requirements.



BORE-MATICS—*The Heald Machine Co., Worcester 6, Mass.* Multi-Way Bore-Matics are furnished as a Bi-Way in two sizes, Models 232 or 332, and as a Tri-Way in two sizes, Models 233 and 333. Machines are designed for work on two or more holes simultaneously from various directions. Up to three individual boring heads or a special multi-spindle head unit can be installed on each "way unit." "Way units" can be operated separately if desired. Control settings make possible different rates of "in" and "out" feeds.

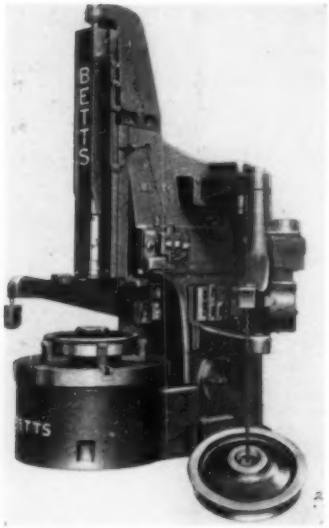
BORING MACHINE — *Electro Arc Mfg. Co., 5930 Commonwealth Ave., Detroit, Mich.* Boring machine disintegrates broken taps, drills, end mills, reamers, and similar work without changing the temper of the metal. Boring machine cuts holes from 0.040 to 1 in. and up in diameter, and in round, square, hexagonal, U- and bar-shapes.



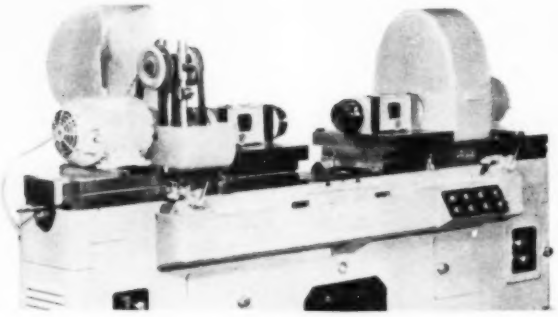


BORING MACHINE — *Hoern and Dilts, Inc., 925 Rust Ave., Saginaw, Mich.* High-production boring machine, designed for use with carboloy cemented-carbide boring bars listed as Model 10-5, is a five-station, 10-spindle type with a boring bar for each work spindle. Capacity of work is 6-in. maximum O. D. and ¼-in. minimum I. D.

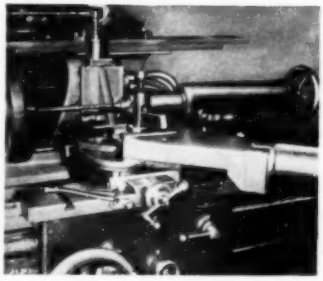
VERTICAL BORING, TURNING MACHINES—*King Machine Tool Division, America Steel Foundries, Cincinnati, Ohio.* Series of vertical boring and turning machines have heads equipped with 4 gibs and 8 bearing surfaces. All controls are located in front of the machine. The illustrated 72-in. model has two ram heads and a side head.



CAR-WHEEL BORER — *Consolidated Machine Tool Corp., Rochester, N. Y.* The high-speed Betts hydraulic-feed car-wheel boring and hub-facing machine has push buttons and control levers conveniently grouped. Capacity is 17- to 48-in. cast-iron or steel wheels using a 5-jaw self-centering chuck.



BORING MACHINE — *Simplex Machine Tool Division, Stokerunit Corp., Milwaukee, Wis.* Precision boring machine, Model 2UA, incorporates a new sealed lubrication system in the boring heads to keep out foreign matter and to improve cooling.



DUPLICATING ATTACHMENTS — *Walker Hydraulic Duplicator Co., Standish, Mich. (Box 73).* Progressively designed one-, two- and three-dimension precision hydraulic duplicating equipment is for high-speed production use on all types of boring mills, milling machines, planers, lathes, grinders and special machinery.

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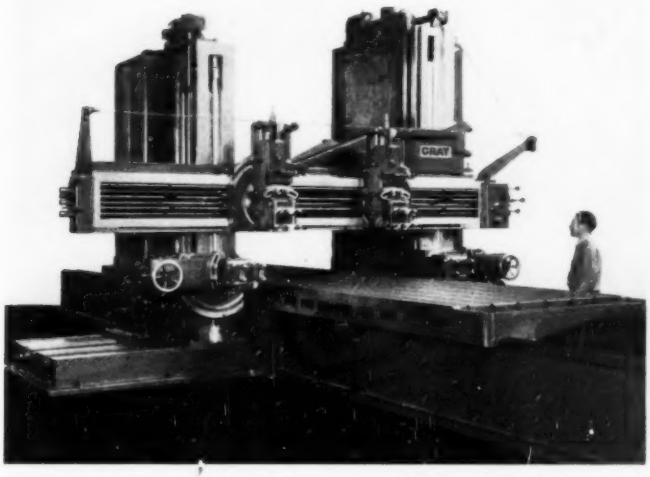
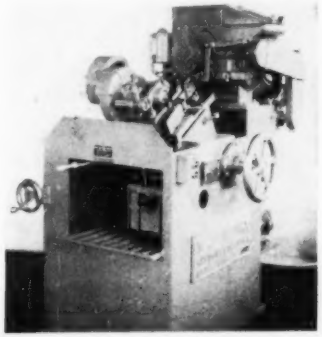
Planing and Shaping



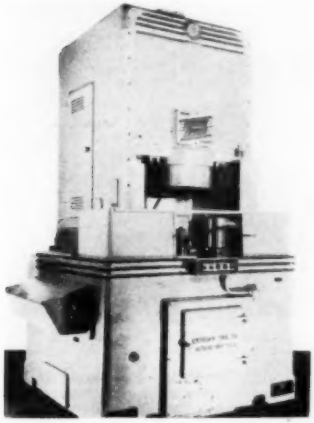
CONVERTIBLE OPENSIDE PLANER—*The G. A. Gray Co., 3601 Woodburn Ave., Cincinnati, Ohio.* Manual or power in-and-out adjustment of the outboard housing provides effective utilization of the left-hand side head. Jobs of unusual width can be accommodated by a self-contained rapid-traverse system.

OPENSIDE SHAPER—*Rockford Machine Co., Rockford, Ill.* The Hy-Draulic 36-in. is redesigned to include two improvements. Range of application is increased by a heavier column and rail and a redesigned sidehead. Setup and operation are said to be improved by dual controls for table operation from either side.

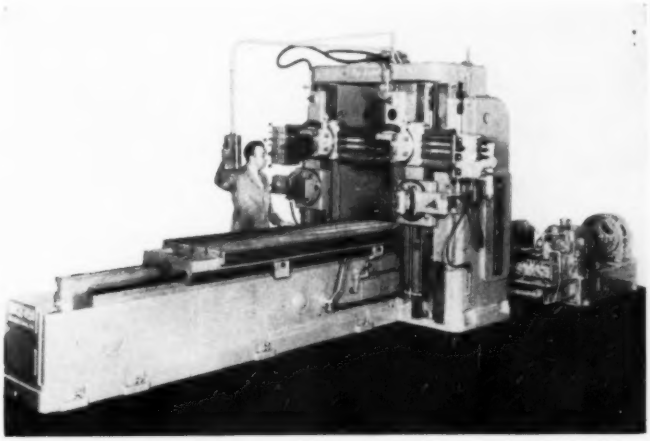


SCREW SLOTTERS—*The Waterbury Farrel Foundry & Machine Co., Waterbury 86, Conn.* Screw slotters are built in four standard sizes with capacities for machine-screw sizes from No. 2 to ½ in. dia. Machines No. 0 and 1 are built with improved hopper feed, twin-cutter burr remover, and infinitely variable production speeds.

SLOTTING — *The Globe Tool & Engineering Co., 436 Davis Ave., Dayton 3, Ohio.* Automatic cuff slot-insulator forming machine is for the cuffing, forming, and cutting of a wide range of sizes of stator cuffed-slot insulators. Machine is said to produce insulators at a rate of 5000 per hr.

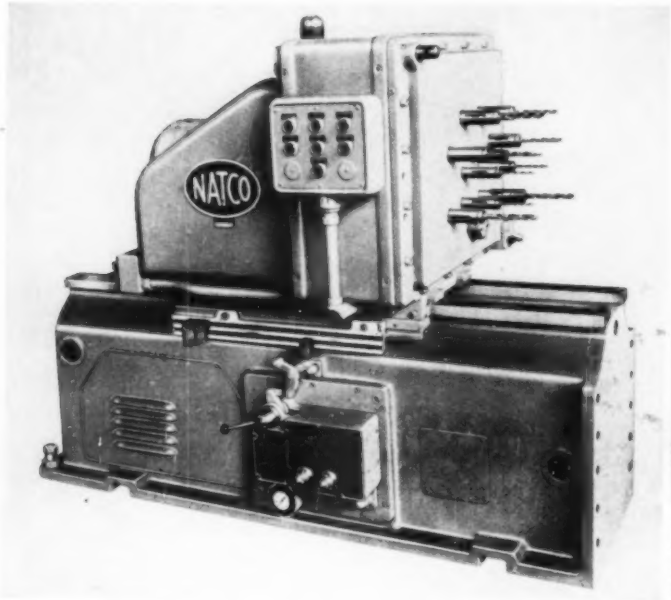


SHAPER — *Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich.* Shear-speed external shaper, Model 181-3 is capable of cutting gears, toothed clutches and other external shapes up to 10-in. O. D. and 2¾-in. thickness. Over-all dimensions are 86½x78½x123 in. Machine cuts all teeth in a gear simultaneously.

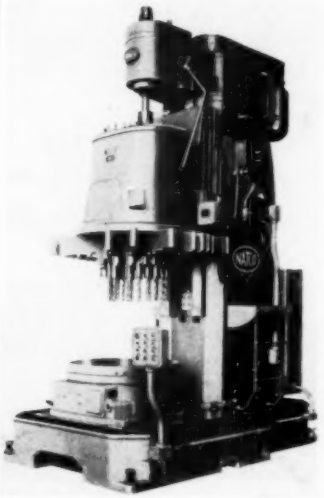


SHAPER-PLANER — *Rockford Machine Tool Co., Rockford, Ill.* Double-housing hydraulic shaper-planer is said to combine the speed of a shaper with the accuracy of a planer. Hydraulic pressure is used for the feeds as well as table drive. Shaper-Planer is offered in three sizes: 24x24, 30x30, and 36x36 in. Dual controls are featured for railhead and table.

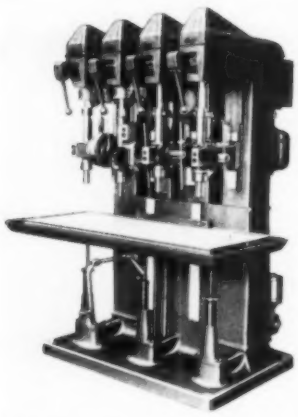
Drilling



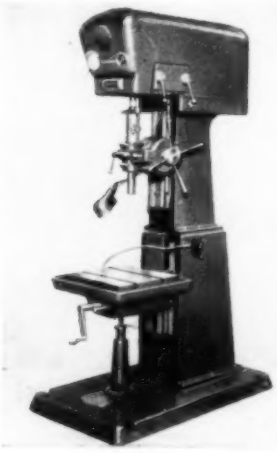
DRILLING, BORING—*The National Automatic Tool Co., Richmond, Ind.* Model C2FT, C3FT, illustated, and C4FT Holesteel floor-type units for constructing way-type machines, are used for drilling, boring, tapping and similar operations.

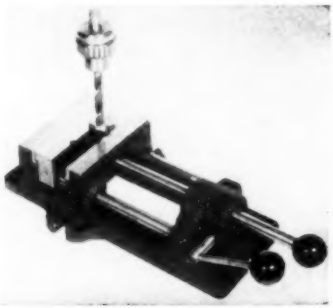


DRILLERS, TAPPERS — *National Automatic Tool Co., Richmond, Ind.* Models C2B, C3B, and C4B, illustrated, Holesteel adjustable multi-spindle drillers and tappers are equipped with electrically-controlled hydraulic feed systems, providing an infinite feed range and pick-off type change gears to permit a wide selection of spindle speeds.



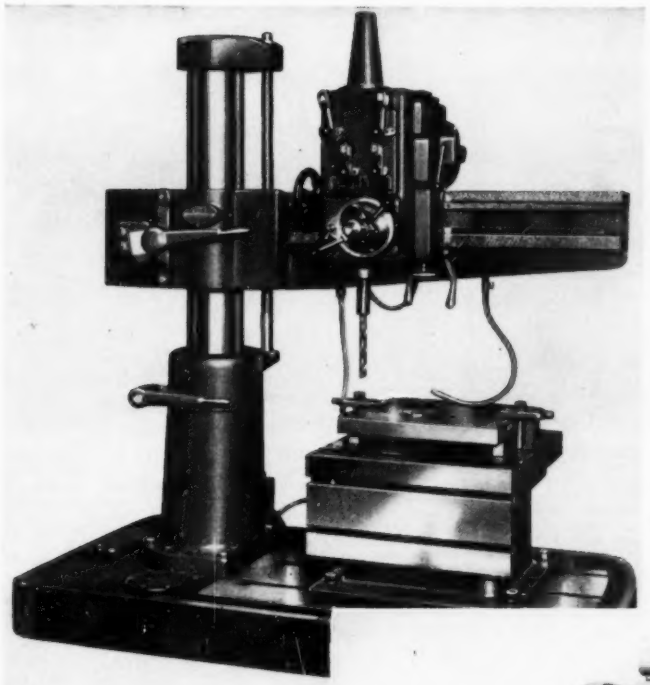
DRILLING MACHINE — *The Avey Drilling Machine Co., Cincinnati, Ohio.* Speed changes are made through selective and sliding gears on the Avey BMA-6 drilling machine. Machine offers six speed changes and features a gear shift similar to that used in shifting an automobile. Capacity of the machine in cast iron is 1¼ in.





DRILLPRESS VISE—*Hartmann Mfg. Co., Racine, Wis.* No. 600 drillpress vise is a frame for jigs and fixtures, for grinding, drilling, and tapping operations. Vise has an opening of 7⅞ in.

DRILLPRESS—*Canedy-Otto Mfg. Co., Chicago Heights, Ill.* The Infi-Speed, with an infinite range of speeds between 150 rpm. and 3400 rpm. is available with or without a 9-speed power ←feed.



DRILLING MACHINE—*Zagar Tool, Inc., Dept. AM-10-X, 23880 Lakeland Blvd., Cleveland 17, Ohio.* Hydraulic drilling machine is said to drill two oven burners in one minute. Drilling 80 holes at one pass, machine automatically handles four burners at one time to complete one every 30 sec.

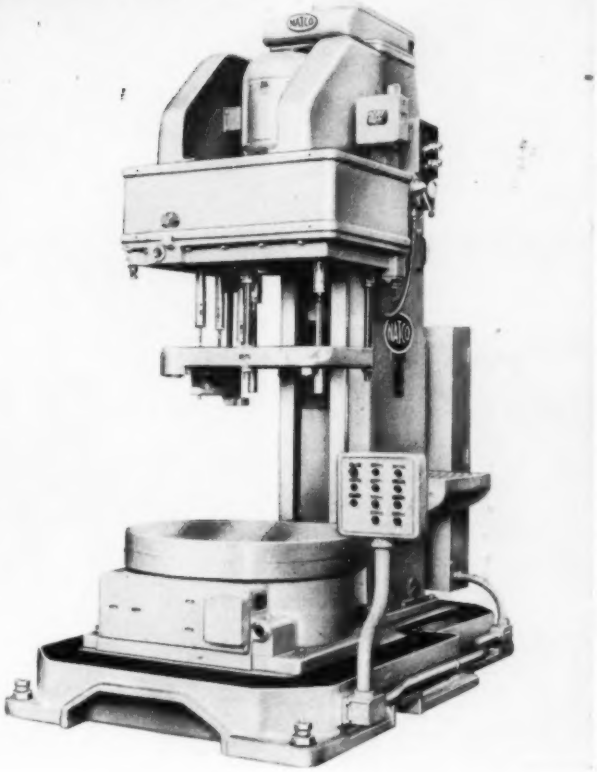
RADIAL DRILL—*Canedy-Otto Mfg. Co., Chicago Heights, Ill.* Bantam radial drill has a maximum operating capacity of 1 in. in cast iron. Drill is available with a 3-ft. arm and 7-in. column, has nine spindle speeds, and is equipped with a single-speed motor and six rates of power feed.

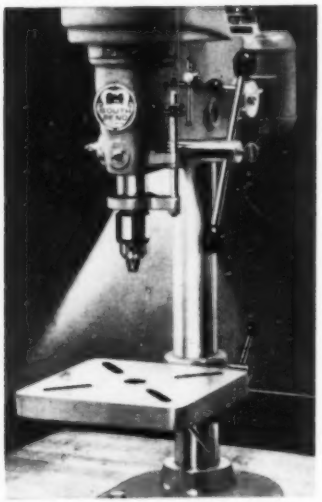
MULTI-SPINDLE MACHINES — *National Automatic Tool Co., Richmond, Ind.* Models C2A, illustrated, C3A and C4A Holesteel vertical machines are for production drilling, boring, tapping and similar operations. The electrically controlled hydraulic-feed system provides an infinitely variable-feed selection within the range of the machine. →

DRILLING & TAPPING MACHINE—*Burg Tool Mfg. Co., 5028 W. Jefferson Blvd., Los Angeles 16, Calif.* Burgmaster automatic-indexing six-spindle drilling and tapping machine does six different operations such as center-drill, drill, ream, tap, counterbore, countersink, spot-face, recess. Unit features a 4½-in. spindle stroke, ½-in. drill and ⅝-in. tap capacity in steel.

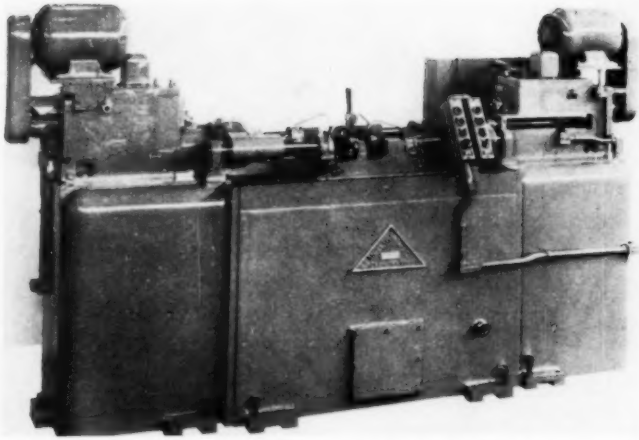
MULTIPLE DRILLHEAD—*Strutz & Mead, Inc., Milwaukee, Wis., for the Wisconsin Drill Head Company.* Heavy-duty series of multiple, adjustable drillheads, part of the Kwick-Change line, is made in 2- to 8-spindle models. Bolt circles vary from 2 3/16 to 14 63/64 in. in the 2-spindle head, to 7 31/64 to 20 17/64 in. in 8-spindle head.

SPECIAL MACHINE — *Snyder Tool & Engineering Co., Detroit, Mich.* Machine for center drilling and facing automotive pistons will handle 444 pistons an hour at 85% efficiency.



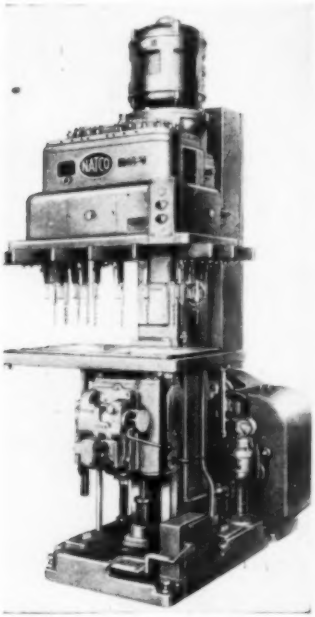


DRILLPRESS — *South Bend Lathe Works, South Bend 22, Ind.* A 14-in. drillpress, available in both bench and floor models, has a capacity to drill ½ in. in iron or steel at the center of a 14-in. circle. Spindle has a max. travel of 4 in. A full-tilt type table has a 10x10-in. top.

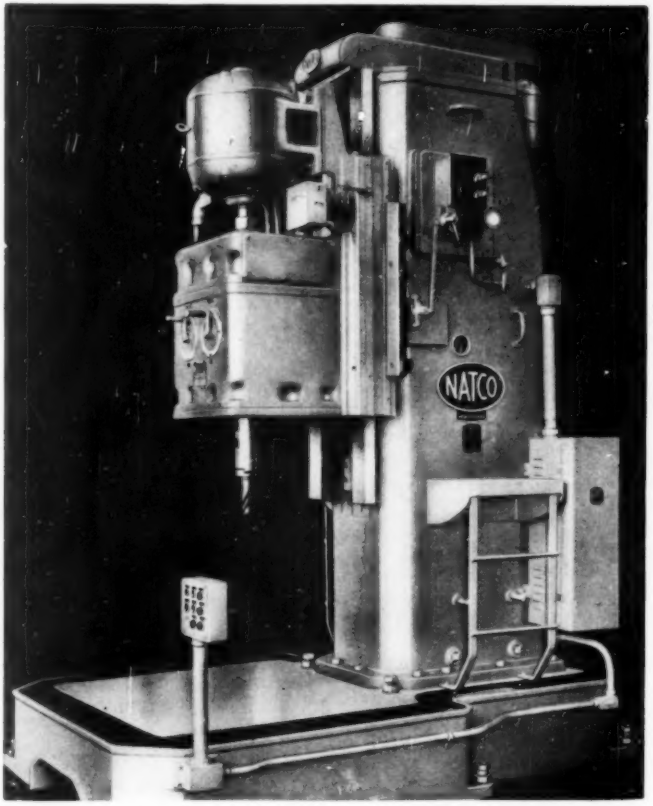


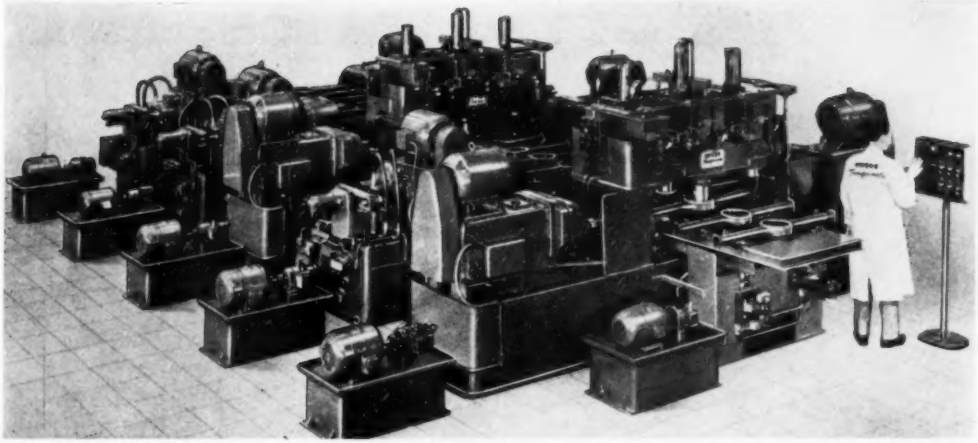
HYDRAULIC - FEED DRILLING UNIT—*Le Maire Tool & Mfg. Co., 2657 South Telegraph Road, Dearborn, Mich.* Unit is illustrated on a Le Maire two-way, four-spindle, horizontal drilling machine used to drill cross holes in a steering idler arm. Two drilling units are shown mounted on the two end bases.

DRILLING MACHINE — *National Automatic Tool Co., Dept. 20, Richmond, Ind.* Heavy-duty hydraulic drilling machine with a single-spindle 7-speed geared head was developed to test the durability of drills, and is equipped with a 30-hp. motor which maintains a synchronous speed up to rated hp. when drills become dull. ↓

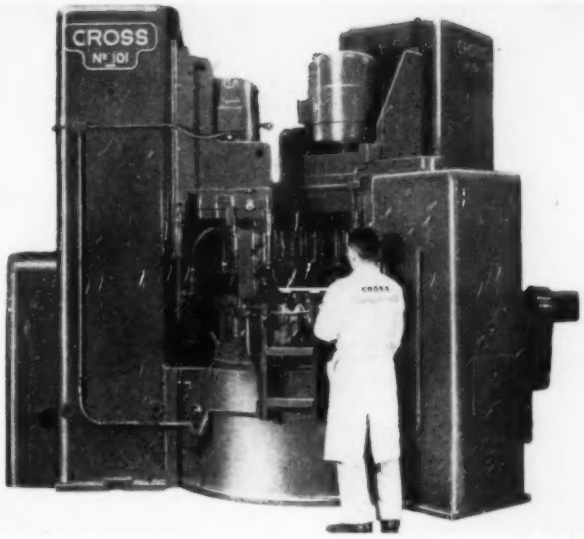


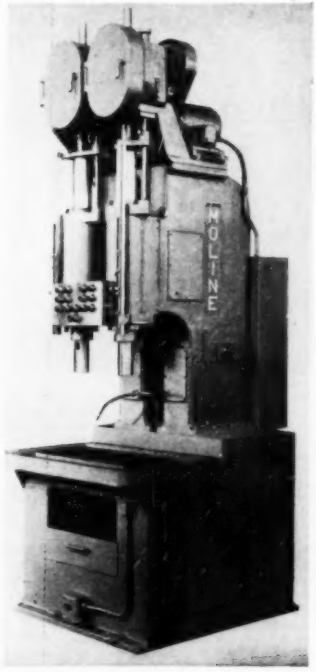
MULTI-DRILLERS, TAPPERS—*National Automatic Tool Co., Richmond, Ind.* Line of high-speed multi-drillers and tappers consists of heavy-duty and light-duty models H-5 and H-6 multi-spindle drillers and tappers, and replaces the standard G-5 and G-6. Models H-5 and H-6 can be furnished with 7x12-in. and 10x24-in. rectangular-drilling-area heads, respectively.





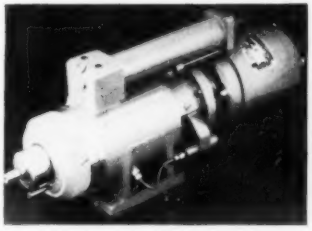
SPECIAL MACHINE—*The Cross Co., Detroit, Mich.* Special machine produces 150 automobile rear-axle housings per hr. with only one operator. A Transfer-matic, it consists of five two-station double-end machines in combination with a transfer mechanism. There are 32 cutting tools in operation simultaneously.





DRILLING MACHINE — *The Cross Co., Detroit, Mich.* Drilling, tapping machine for production of automobile rear-axle differential carriers, is a seven-station machine. It drills, countersinks, and reams 10 flange holes; drills, countersinks, and taps 4 bearing-cap holes; drills and taps the drain hole. Machine completes 150 differential carriers per hr. at 80% efficiency.

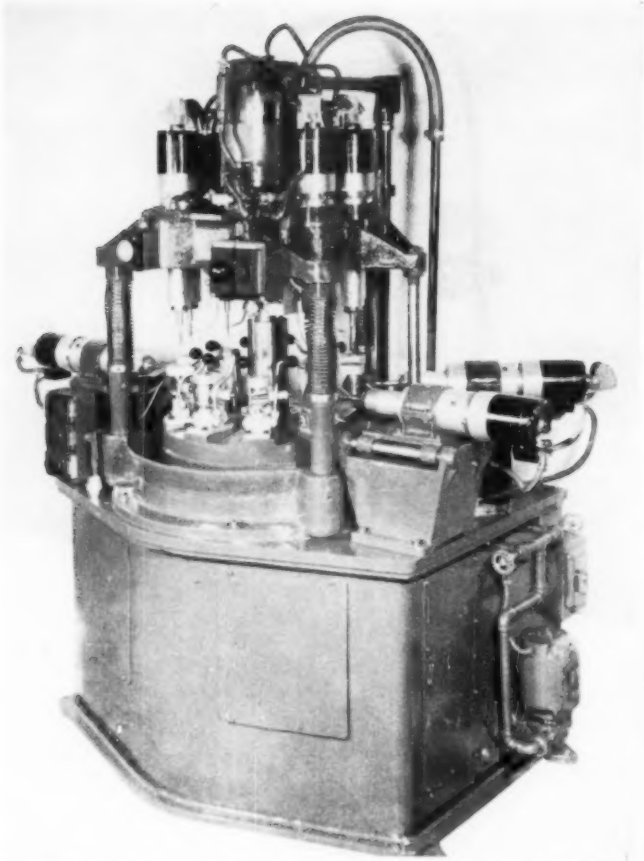
SPECIAL MACHINE—*Cross Co., Detroit 7, Mich.* Special machine finishes parts, in clusters of four cast in a single piece. Machine facilitates both finishing and handling. A total of 150 sets or 600 individual valve rocker-shaft brackets are processed hourly.



DRILL UNIT — *Cleveland Republic Tool Corp., 9615 Meech Ave., Cleveland 5, Ohio.* The speed of the motor does not affect the rate of feed which is hydraulic. The capacity of the drill unit is from No. 80 drill to 5/16 in. in cast iron and ¼-in. dia. drill in steel. The maximum stroke including the rapid approach is 1½ in.

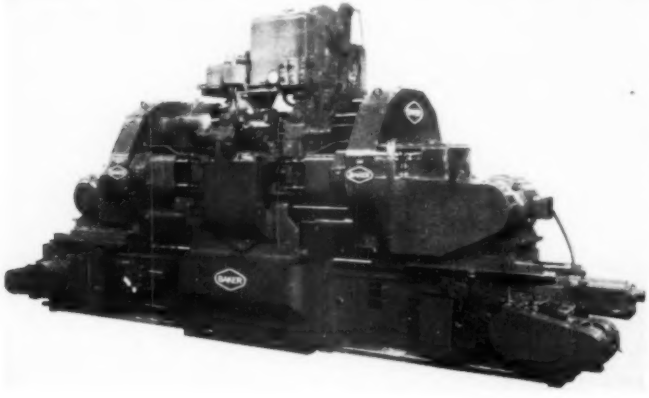
DRILLING MACHINE—*Moline Tool Co., Moline, Ill.* Drilling machine, model HF148 is a two-column model with individually controlled hydraulic feed to each of the two spindles. Spindle capacity is 1⅛-in. drill in mild steel. Electrical control of hydraulic feed permits an independent, automatic operating cycle for each spindle.

TRANSFER - MATIC MACHINE — *The Cross Co., Detroit, Mich.* Special machine combining four finishing operations on automotive-cylinder blocks is part of the Transfer-matic line which incorporates a continuous automatic materials-handling device. Machine cuts four cylinder blocks at one time progressively.

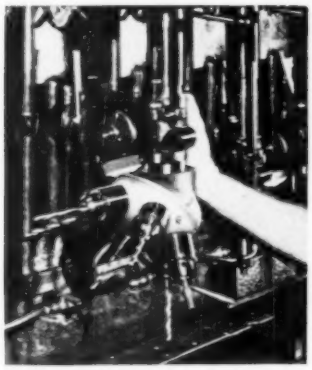


SPECIAL AUTOMATIC MACHINE—*Simplex Tool Engineering Co., 2540 Park Ave., Detroit 1, Mich.* Special automatic machine for drilling and reaming refrigerator parts incorporates nine units and is an automatic type with dial feed using lever-operated pump jigs to hold the part.

MULTI-OPERATION MACHINE—*Baker Bros., Inc., Toledo, Ohio.* Drilling, boring, reaming, counterboring and tapping operations on automobile front-wheel spindle supports are performed on this 6-station multi-operation machine. Machine has an automatic power-indexing trunnion.



DRILLHEAD—*Thriftmaster Products Corp., Lancaster, Pa.* Universal joint-drive drillhead features a high overload capacity, and is made for use with power feed. Unit is furnished with 2 to 6 spindles, with a minimum of 1¼-in. center spacing within a 6¼-in. dia. circle, and is made for right-hand rotation of drillpress.

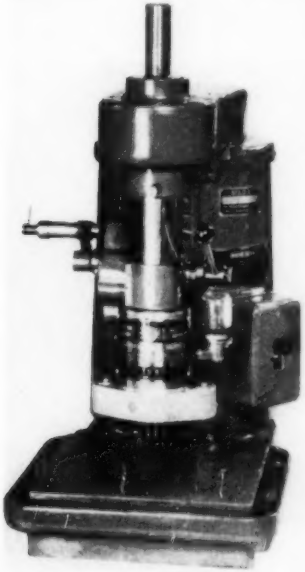


DRILLPRESS TURRET — *Howe & Fant, Inc., South Norwalk, Conn.* Self-centering drillpress turret is constructed so that its six spindles are automatically centered and aligned by the drillpress spindle. Known as the Ligno-matic drill turret, the spindles are free to move laterally and angularly as well as to rotate.

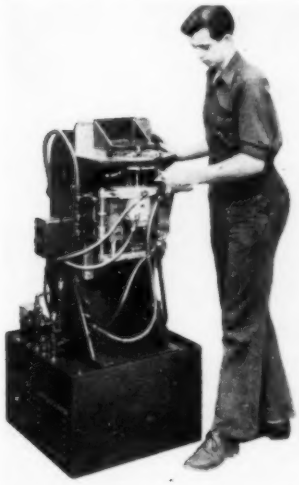
PORTABLE DRILLPRESS—*Dremel Mfg. Co., Racine, Wis.* Light portable drillpress for handling fine work is powered by a power unit, capable of attaining a speed of approximately 27,000 rpm., which can be raised, lowered, swung in any direction, or removed. Depth gage gives fine control. Drillpress is 12x6¾x4 in.

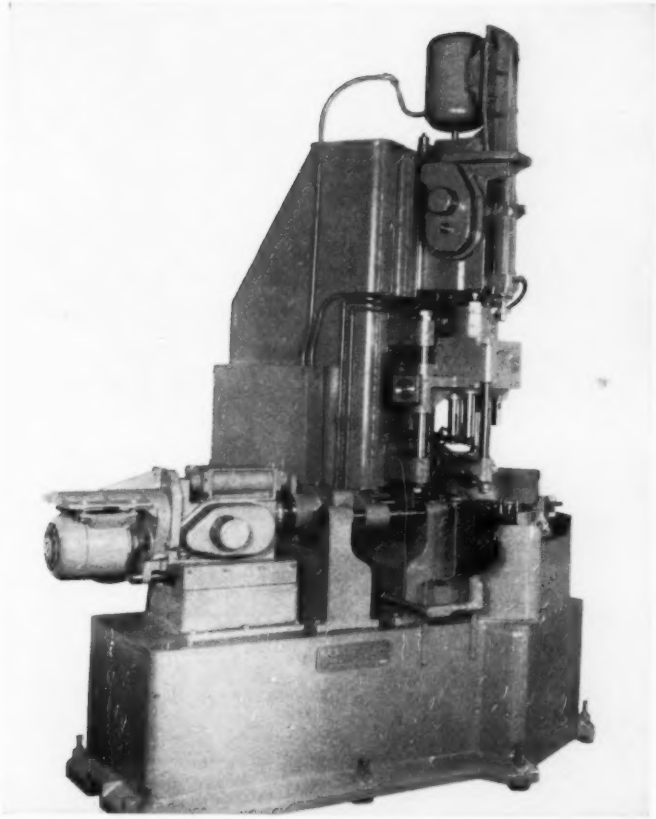
POWER UNIT—*Locke Gage Co., 10232 Woodward Ave., Detroit 2, Mich.* Automatic drilling and tapping power unit is designed for infinite valve-pressure control up to 500 lb. by use of a built-in air compressor. Two feed rates control break-through and half-hole drilling.

INDEXING MACHINE — *W. K. Millholland Machinery Co., Indianapolis 5, Ind.* No. 3 vertical automatic-indexing machine for high-production machining, performs a variety of operations such as drilling, counterboring, reaming, and milling. Machine illustrated is equipped with a No. 3 Millholland automatic cam-feed unit with a 5-hp. motor.



GEARLESS DRILLHEADS — *Zagar Tool, Inc., 23880 Lakeland Blvd., Cleveland 17, Ohio.* Gearless drillhead is shown mounted on a Sigourney Sensitive drillpress for light-weight work. The head has eight spindles on a 1-in. circle. Drillhead can be adapted to other drillpresses in a similar manner.



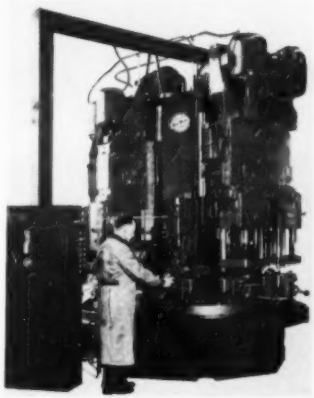


AUTOMATIC INDEX MACHINE — *Millholland Machine Co., 1048 Fairfield Ave., Indianapolis 5, Ind.* No. 5 Millholland automatic index machine incorporates in a vertical position the redesigned No. 5 automatic unit which has a 10-hp. capacity and 6-in. stroke. The horizontal side head shown is the No. 4 size with a 5-hp. drive and 5-in. stroke.

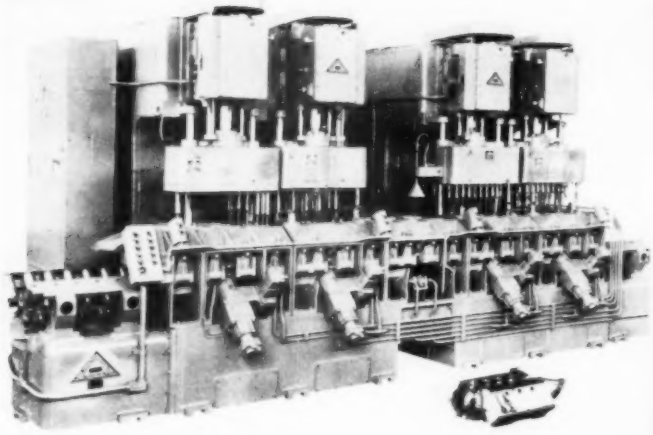
DRILLING UNIT—*Simplex Tool Engineering Co., 2540 Park Ave., Detroit 1, Mich.* Automatic drilling unit is redesigned to include a bath of oil for moving parts. The unit drills holes ranging from No. 5 to 5/16 in. in diameter. Drill is self-contained and can be mounted at any angle or plane.

SPECIAL MACHINE — *Sommer and Adams Co., subsidiary of The Federal Machine and Welder Co., Warren, Ohio.* Machine for drilling, reaming and counterboring automobile-engine connecting rod and caps produces over 240 assemblies per hr. with a single operator, and has five stations, an automatic cycle, and push-button control.

SPECIAL-PURPOSE MACHINE — *Zagar Tool Inc., 23880 Lakeland Blvd., Cleveland 17, Ohio.* Special-purpose machine is for drilling holes from underneath. Holes are drilled in this manner for the purpose of clearing out ←chips.

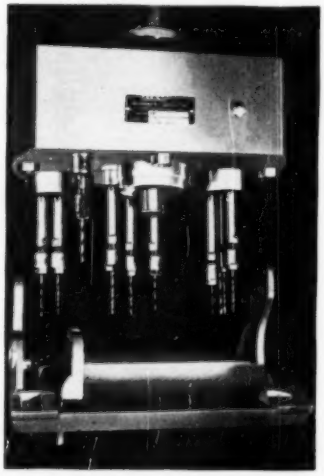


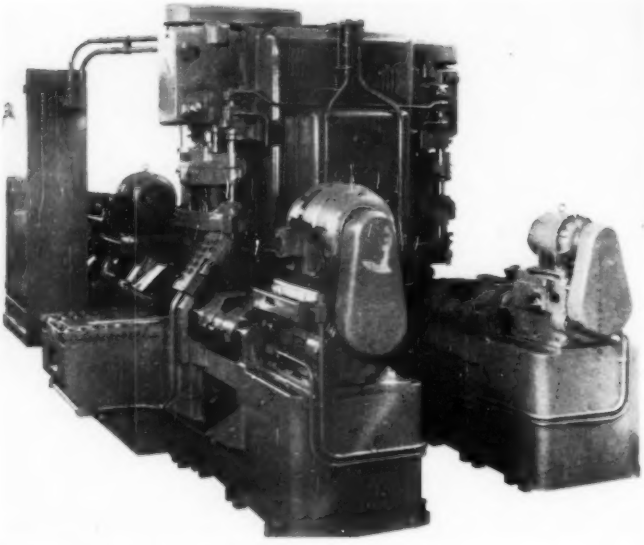
INDEXING TYPE MACHINE—*Davis & Thompson Co., Milwaukee, Wis.* Multiple-operation, 8-station indexing-type machine, added to the Rotomatic line, is listed as Model VSI. Machine illustrated drills, reams, and chamfers a 1.281-in. hole and saws slots in both ends of front-suspension spindle-support arms.



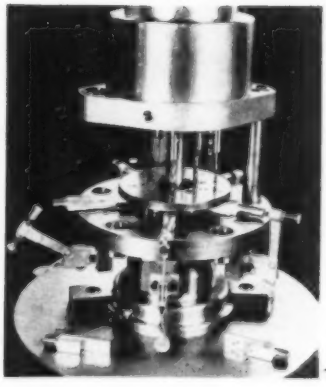
DRILLING MACHINE—*Le Maire Tool & Mfg. Co., Dearborn, Mich.* Line-process drilling machine works 72 V-8 cylinder blocks per hr. with drilling, reaming, counterboring, and chamfering operations. Loading and unloading mechanisms are supported ◄ on two end bases.

SPECIAL MACHINE—*Le Maire Tool & Mfg. Co., 2657 South Telegraph Road, Dearborn, Mich.* Special machine is being used to drill, spotface, ream, countersink, and tap seven holes in approximately 138 automotive-transmission rear-bearing retainers per hr.





DRILLHEAD—*Errington Mechanical Laboratory, Inc., Staten Island 4, N. Y.* A 10-spindle multiple drilling head can be used for drilling ten different sized holes on various elevations. The head has grooved thrust ball bearings at all thrust points and hardened-bronze radial bearings.



SPECIAL MACHINE — *Le Maire Tool & Mfg. Co., Dearborn, Mich.* A 74-spindle, special-purpose automatic machine for automobile manufacture drills, line reams, chamfers and counterbores holes in the tops and end surfaces of V-8 engine blocks. The machine has five stations: load, drill, idle, chamfer, ream and counterbore, and unload.

DRILLING MACHINES — *The Simplex Tool Engineering Co., 2540 Park Ave., Detroit 1, Mich.* A 4-way drilling machine drills holes in typewriter covers. The automatic high-speed unit drills four holes in the part from underneath.

DRILLHEAD, INDEX FIXTURE—*Zagar Tool, Inc., Dept. AM-1-X, 25880 Lakeland Blvd., Cleveland, Ohio.* Seven-spindle gearless drillhead combined with a 1-in. capacity index fixture drills seven holes, ranging in size from No. 48 to 5/32 in., simultaneously. ◄

PORTABLE ATTACHMENTS—*J. D. Whittle Co. Small Tools Div., 208 N. Wells St., Chicago 6, Ill., Dept. AM-1.* Four interchangeable attachments for electric hand drill and drillpress enable sanding, polishing, grinding, filing and sawing of wood, steel, plastic and other similar materials, utilizing the same power unit. Units have no gears or crankshafts. Offered are: two saw and file attachments, a 3-in. disk sander, and a screwdriver attachment.

SPECIAL MACHINE—*Snyder Tool & Engineering Co., Detroit, Mich.* Two-way hydraulic feed machine automatically drills, reams, countersinks, spotfaces, bores, and taps holes in both ends of hydraulic-lift cylinder blocks. Machine has eight stations with eight trunnion-mounted work-holding fixtures. Automatic index routes work.

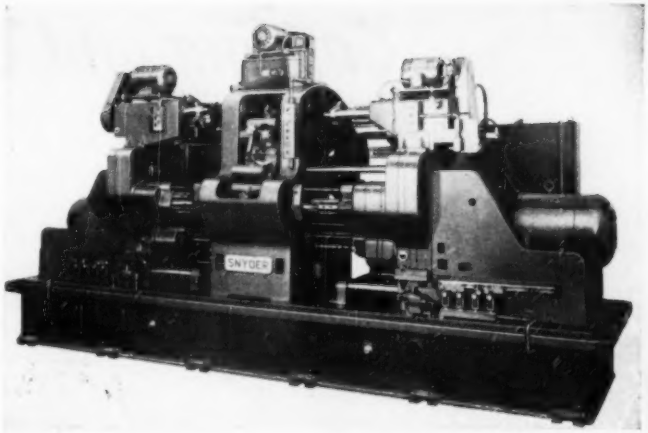
TRANSFER-TYPE MACHINE — *Snyder Tool & Engineering Co., 3440 E. Lafayette St., Detroit, Mich.* Automotive intake manifolds are transferred by this machine. Cycle time for working 57 holes is 48 sec. Drilling, reaming, spotfacing, tapping, countersinking, and threading operations are completed in the eleven stations.

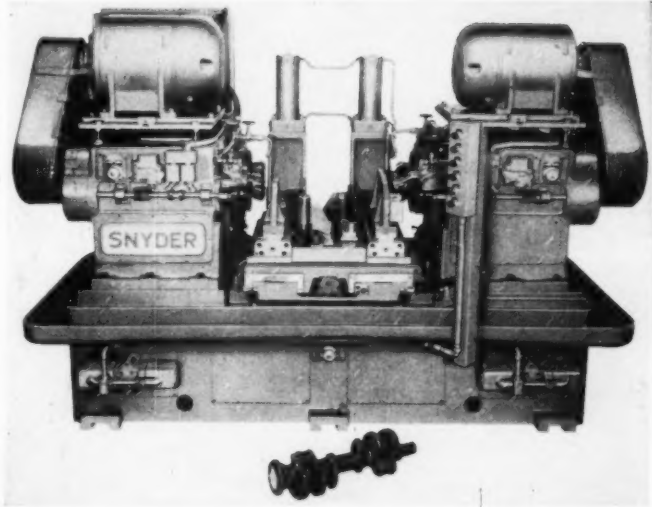
SPECIAL MACHINE — *Snyder Tool & Engineering Co., Detroit 7, Mich.* Machine combines a series of core-drilling, drilling, boring, counter-boring, spotfacing, chamfering, and semi-finish-boring operations. Transfer mechanism is hydraulically actuated and transfers eight cylinder blocks simultaneously.

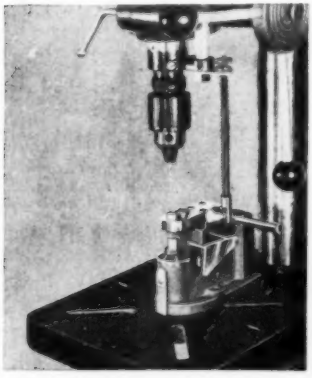
SPECIAL MACHINE—*Snyder Tool & Engineering Co., Detroit, Mich.* Automatic machine for drilling oil holes in steel crankshafts indexes workpieces past series of self-contained automatic vertical, horizontal and angular machining units. Units drill and deep-drill oil holes as well as drill and ream two welch plug holes in cranks.

SPECIAL MACHINE—*Snyder Tool & Engineering Co., E. Lafayette, Detroit, Mich.* Cross-shaft holes are drilled and line bored in 70 different sizes and types of clutch housings. Two stations permit drilling and boring operations to be performed simultaneously. Estimated production is 65 pieces per hr. at 80% efficiency.

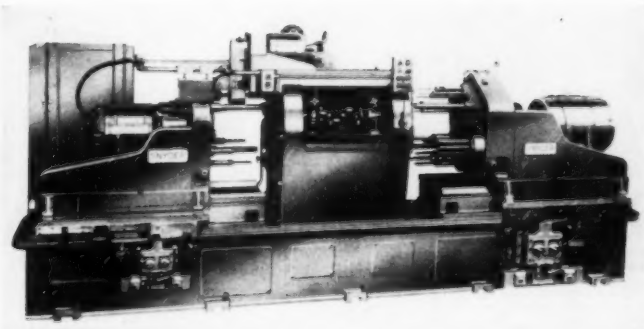
SPECIAL-PURPOSE MACHINE — *Snyder Tool & Engineering Co., E. Lafayette, Detroit, Mich.* Machine faces and center drills the ends of crankshaft forgings at the rate of 47 pieces per hr. at 80% efficiency. Forging is located in the fixture manually and held by means of hydraulically actuated clamps. →







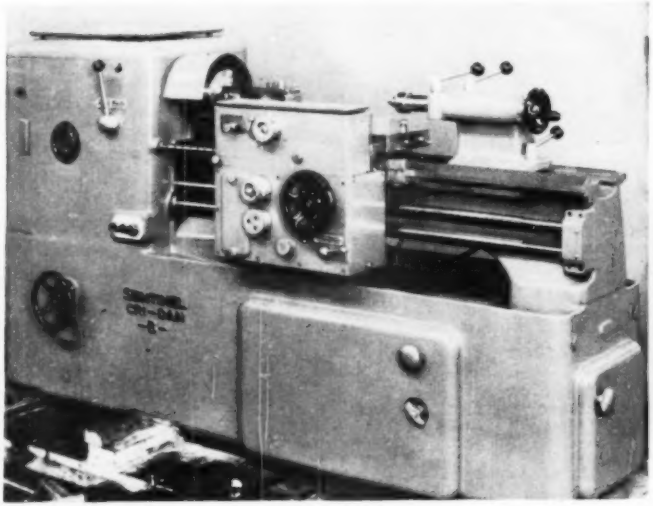
DRILL JIG—*The Manufacturer's Engineering Service, Security Bldg., Toledo 4, Ohio.* Kam-Grip Model 750 drill jig is designed for cross-drilling operations on a variety of diameters and hole sizes on pins, small shafts, tubing, and other parts. Cam action is employed to actuate anvil up and down, to and from locking position.



SPECIAL MACHINE—*Snyder Tool & Engineering Co., Detroit, Mich.* Drilling, counterdrilling, chamfering, tapping, and reaming operations on automotive crankshaft can be done on a special machine designed to maintain accurate relationship of the holes processes. Five stations are used for working positions and one for loading and unloading.

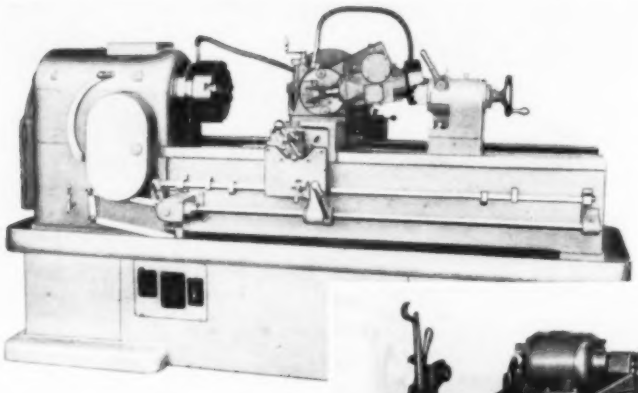
AMERICAN MACHINIST 36th ANNUAL REVIEW

Tapping and Threading

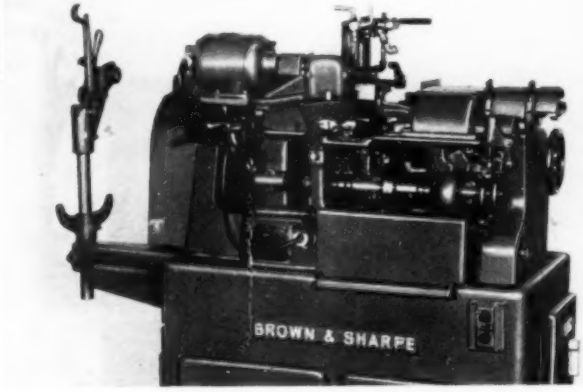


THREADING MACHINE—*The Lees-Bradner Co., Cleveland, Ohio.* Sentinel Cri-San semi-automatic high-speed threading machine is a type of lathe in which the cutting tool is traversed through the cut at rates up to 100 strokes per min. Pitch-diameter tolerances 0.001 in. are said to be held. Multi-start threads up to 12 in number can be produced with automatic indexing. ←

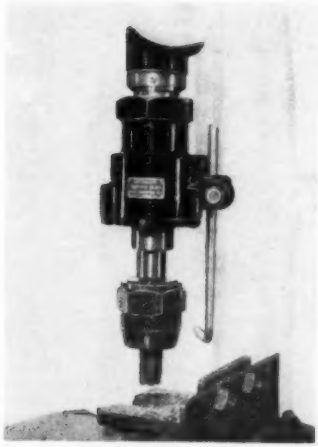
TAPPING HEAD—*Commander Mfg. Co., 4225 W. Kinzie St., Dept. AM, Chicago, Ill.* Tapping head is claimed to replace three conventional tappers because it can handle taps to $\frac{3}{8}$ in. Tapper is designed to fit any drillpress, and employs a spring clutch drive and an adjustable torque control.



AUTOMATIC SCREW-THREADING MACHINE—*Brown & Sharpe Mfg. Co., Providence 1, R.I.* Automatic screw-threading machine is said to give unusually high production of small screws, nuts and bushings because it is designed to take advantage of overlapping operations and reduce idle time. There are 16 work-spindle speeds from 454 to 5000 rpm. Machine handles stock to $\frac{3}{8}$-in. dia. ↓

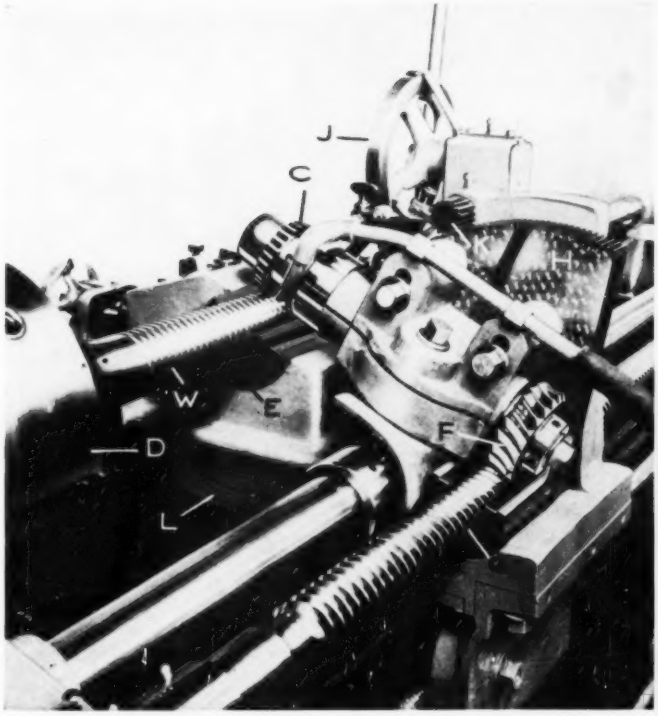


THREAD MILLING MACHINE—*James Coulter Machine Co., Bridgeport, Conn.* Coulter Model TM Thread Master thread milling machine is the single-cutter type developed for thread-milling operations on long operating screws with threads which are too long to be produced by the multiple-thread milling cutter method. Machine is offered in three bed lengths to handle work between centers of 24, 42, and 60 in.

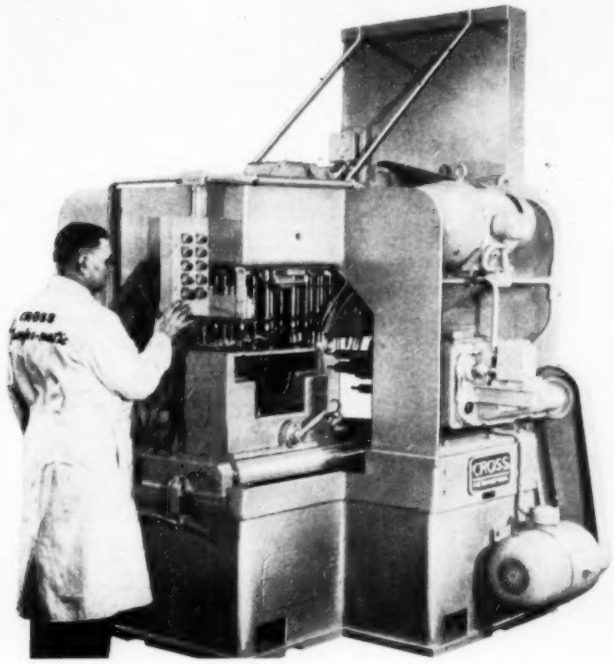


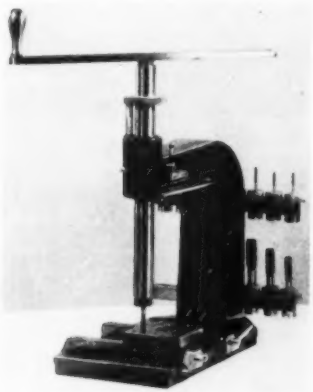
TAPPING ATTACHMENT—*Dorman Machine Tool Works, South Mount Vernon, N. Y.* Heavy-duty automatic-reverse tapping attachment is for ¾- to 2-in. pipe taps and standard hand or screw-machine taps. The attachment is designed for back-geared drill-presses. It will drive and automatically reverse taps of ¾ to 2 in.

TAPPER—*Cross Company, Detroit 7, Mich.* Special machine tool for moderate production taps 60 holes in an automatic transmission case at the rate of 65 pieces hourly. The work cycle is automatic and push-button controlled.

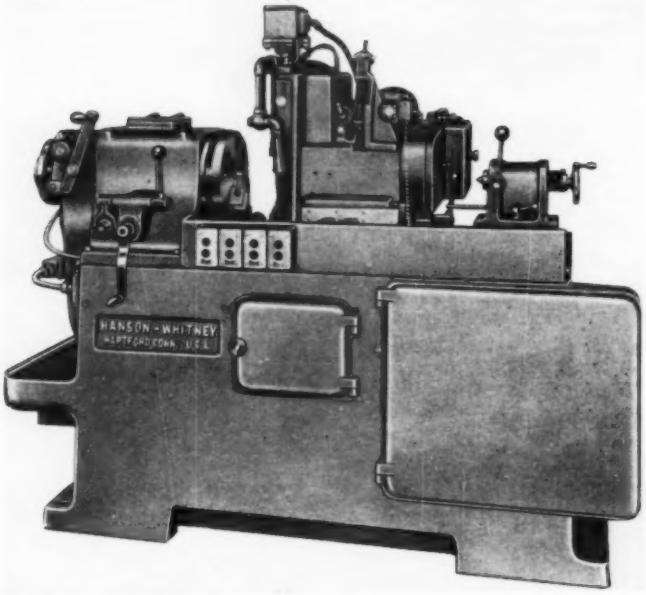


THREAD-GENERATING MACHINE—*The George Scherr Co., Inc., New York 12, N. Y.* Cornelis thread-generating machine is an automatic machine adapted for the production of machine-tool lead screws, feed screws, worms and similar items. The bar or worm blank to be threaded is held on one end in a universal self-centering chuck or a special holding fixture.

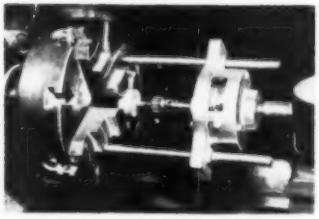




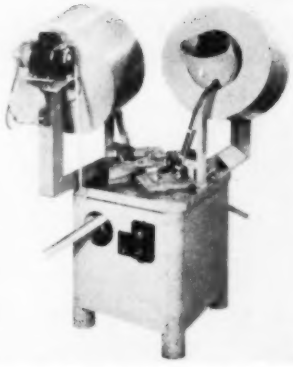
TAPPER, THREADER—*Lassy Tool Co., Plainville, Conn.* Bench-model No. 12 single-spindle tapper and threader, for bench or wall mountings has direct-reading depth gage. Spindle is hollow for lightness. Tap capacity is ⅛ to 1 in.; spindle diameter is 1¼ in.



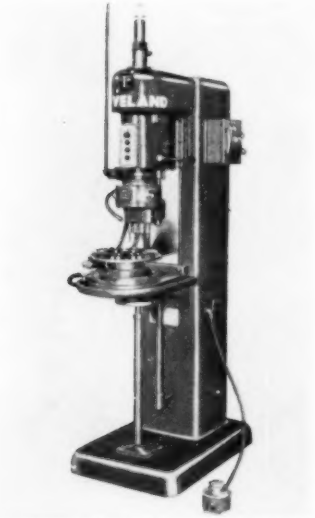
THREAD GRINDER — *The Hanson-Whitney Machine Co., Hartford, Conn.* High-speed thread grinder is designed to provide uninterrupted grinding of external threads. A master roll maintains the life of the crusher roll, which in turn crush-forms the grinding wheel with a wide variety of multi-thread patterns which are then transferred to the work.



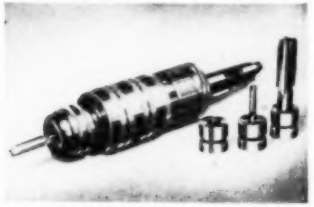
TAPPING HEAD — *Errington Mechanical Laboratory, Inc., Staten Island 1, N. Y.* Auto-reverse turret-lathe tapping head permits a hole to be tapped and the tap to be backed out without stopping the work or reversing the machine in a turret-lathe setup. With the aid of a friction clutch, blind holes can be tapped without breakage.



THREAD-ROLLING MACHINE — *D. H. Prutton Machinery & Tool Co., 5295 West 150th Street, Cleveland, Ohio.* Rotary thread-rolling machine listed as the Rollmaster, loses no motion by reciprocation movements. Bolts and studs of various descriptions to ¼ in. in diameter can be run through threading, ribbing, knurling, marking, necking, and similar operations.



TAPPING MACHINE — *Cleveland Tapping Machine Co., Hartville, Ohio.* Model EO lead-screw tapping machine is powered by a ¾-hp. 1200-rpm. high reversal motor. It will tap single holes up to ½-in., National Coarse Thread in mild steel, or, using multiple heads, up to eight No. 6-32 or four ¼-in. holes. Tapping depths are controlled to within 0.005 in.



TAPPING ATTACHMENT—*Wickman Mfg. Co., 15533 Woodrow Wilson Ave., Detroit 3 Mich.* Tapping attachment designed to eliminate tap breakage, is known as the Jay-Dee. The attachment is said to guarantee tap safety. No coil springs are used to provide driving pressures.

JOINT-THREAD MILLING — *The Cross Co., Detroit 7, Mich.* Four-station continuous-cycle machine, requires one operator. Operator unloads, loads, and presses a button. Power rapid traverse automatically positions work with cutter. Entire machine rotates each station coming to operator as part is finished. Four pieces are completed with each revolution.

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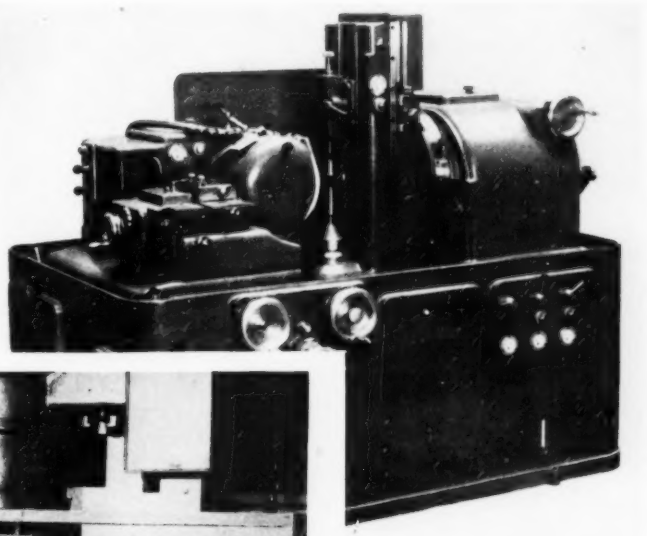
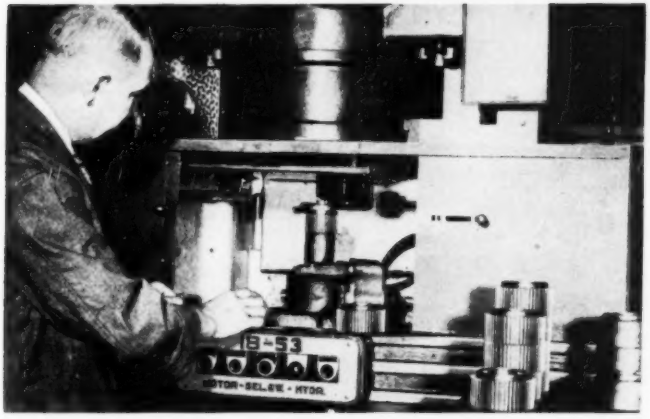
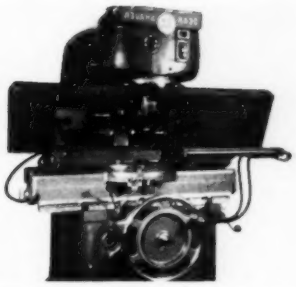
Gear Cutting and Finishing

GEAR GRINDING MACHINE—*Reishauer, Zurich, Switzerland; offered by Cosa Corp., Chrysler Bldg., 405 Lexington Ave., New York 17, N. Y.* The Reishauer gear-grinding machine, Type ZA, will grind high-precision gears for high production. A single thread-grinding worm with rack profile can generate the theoretical shape of the tooth. →

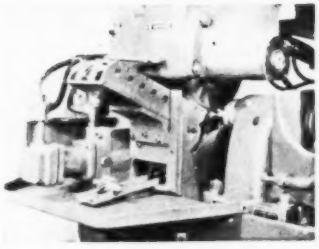


GEAR-CUTTING MACHINE — *Michigan Tool Co., East McNichols Rd., Detroit, Mich.* Five hundred fifty cast-iron transmission clutch gears per 8-hour shift including down-time for tool sharpening is the output of this single-spindle gear-cutting machine. Using no coolant, the gear shaper cuts all teeth of one 4-in. dia. 51-tooth, 1-½-in. face-width clutch simultaneously—in 33 sec. ↓

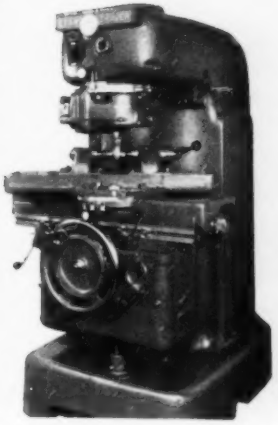




GEAR-SHAVING MACHINES — *National Broach and Machine Co., 5628 St. Jean at Drummond, Detroit, Mich.* Red Ring fast-lock tailstock and automatic splash-guard door are offered on gear-shaving machines. The fast-lock tailstock reduces the operation of loading the work to one motion.



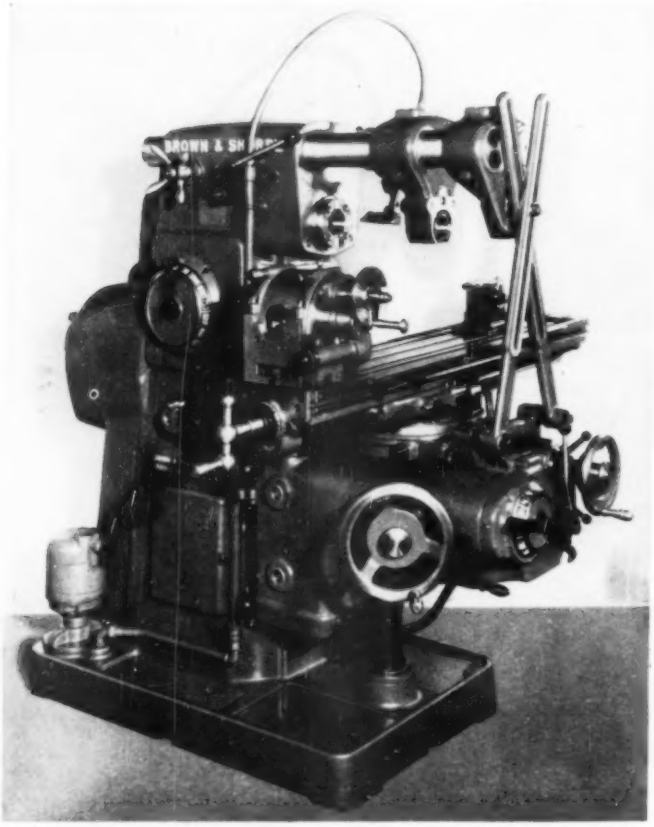
LOADER FOR GEAR SHAVING—*National Broach and Machine Co., 5600 St. Jean Ave., Detroit, Mich.* Automatic loading mechanism is for use with Red Ring Diagonal gear shaving machines, Models GCV and GCU. Actual time for loading and unloading of a gear by this mechanism is 2.3 sec. Machines run continuously as long as magazines are supplied with work gears.



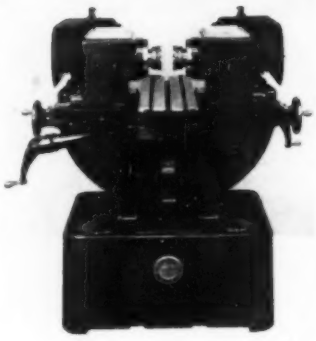
GEAR-SHAVING MACHINE — *National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich.* Red Ring universal diagonal gear-shaving machine can shave by either the diagonal or conventional method. Any gear being shaved conventionally can at the same time be given the Elliptoid tooth form by rocking the table as it is being reciprocated.

AMERICAN MACHINIST 36th ANNUAL REVIEW

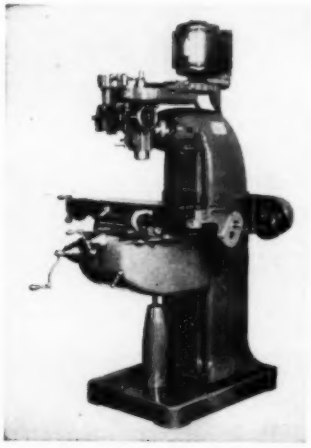
Milling



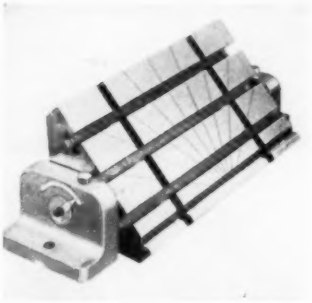
PLAIN, UNIVERSAL MILLERS—*Brown & Sharpe Mfg. Co., Providence 1, R. I.* Universal and plain milling machines designed to take heavier cuts, have an increased vertical capacity, a No. 50 milling-machine standard-taper hole in the spindle, and spindle speeds for larger cutters. A lever selects any of the 18 spindle speeds from 30 to 1200 rpm. Universal and plain machines have a longitudinal feed of 28 in., transverse feed of 10 in., and vertical feed of 16½ in.



POWER-FEED ARRANGEMENT—*Brown & Sharpe Mfg. Co., Providence, R.I.* A spindle power-feed arrangement for the No. 12 plain milling machine permits milling cycles that require accurate lowering and raising of the machine spindle with the regular table movements. Feed rates of the spindle head are possible from ½ to 7⅝ ipm., by use of change gears, and are independent of table feeds.

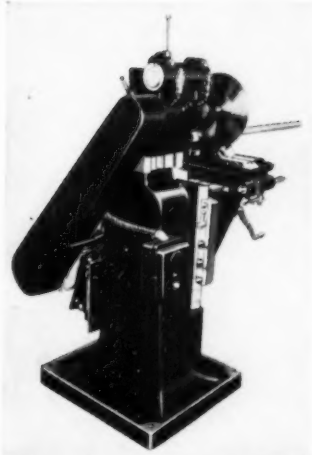


VERTICAL MILLING MACHINE—*The Index Machine Co., 543 N. Mechanic St., Jackson, Mich.* High-speed vertical milling machine, Model 50, has a table size of 8x34 in. with three table speeds that can be varied, and 12 cutter speeds to 2400 rpm. Spindle down feed and table feed are automatic.



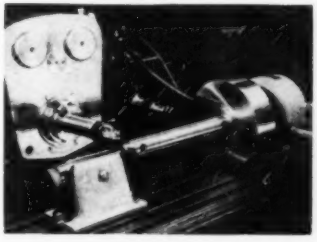
WORKTABLE—*Malnar Machine & Tool Co., Inc., 19301 St. Clair Ave., Dept. AM-10, Cleveland 10, Ohio.* Universal worktable fastens to any milling machine. It is 16⅞ by 9⅛ in., and enables operator to tilt work from 0 to 45° in either direction and lock it at desired angle.

TWIN MILLER—*W. H. Nichols Corp., 50 Church St., New York 7, N. Y.* Twin miller is a double-spindle high-precision miller for light-duty work where two surfaces can be milled in one pass. Machine has two opposed independent-geared milling heads powered by pancake-type motors, each offering ◄—15 spindle speeds 55 to 2080 rpm.

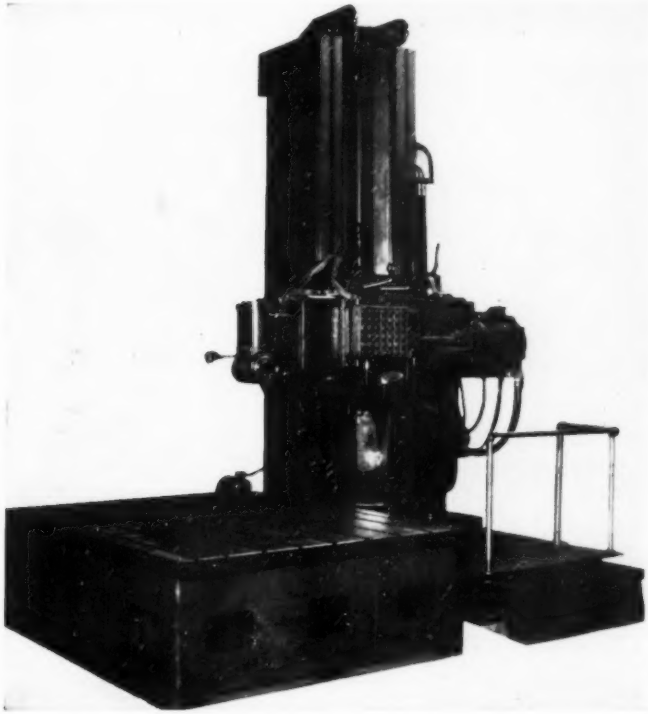


MILLER—*United States Machine Tool Co., Cincinnati, Ohio.* High-speed hand-feed milling machine cuts plastics and non-ferrous metals. Machine attains a speed of 3500 rpm., and is adaptable to high-speed cutting of aluminum bars and tubes as well as cutting Plexiglas, lucite, and other plastics.

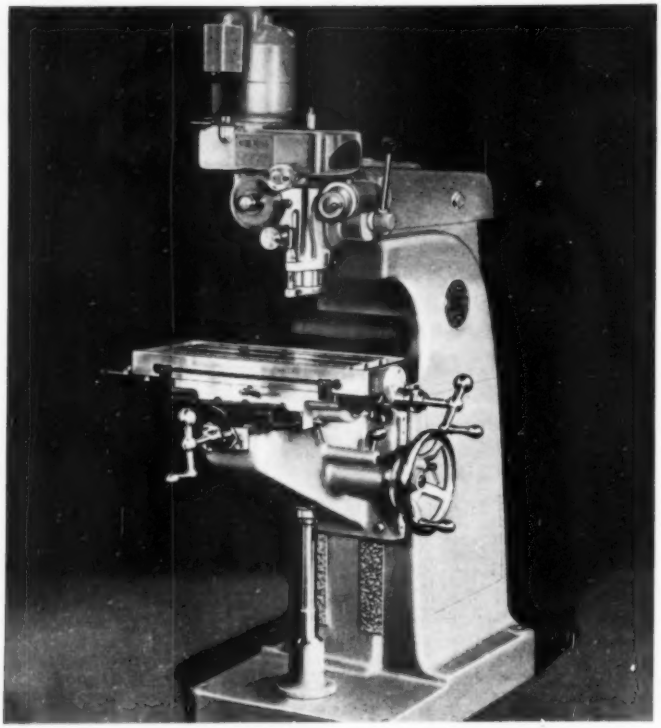
MILLING MACHINE — *The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.* Dial-type milling machine is built in medium- and high-speed ranges, in plain, illustrated, universal, and vertical types, with a total of 18 different models. High-speed machines have 21 spindle speeds, 20 to 1500 rpm. for the No. 2 size, and 18 to 1300 rpm. for the No. 3 and 4 sizes. Twenty-four feeds cover a range of 5/16 to 60 ipm.



MILLING FIXTURE—*Erickson Tools Div., 2309 Hamilton Ave., Cleveland 14, Ohio.* Automatic holding and indexing fixture for milling operations can be indexed automatically by connecting it with table control. Part held is located from the outside diameter.



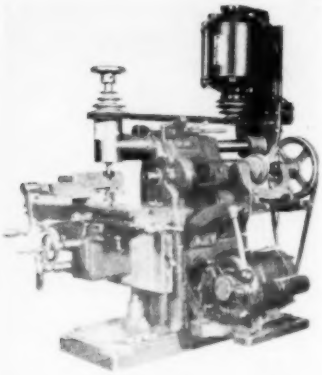
MILLER—*Cincinnati Gilbert Machine Tool Co., 3366 Beekman St., Cincinnati 23, Ohio.* Electro-hydraulically operated floor-type milling machine for punch-press frames can machine the bolster seat, slides, gib pads, and crankshaft cap seat of a 60T O.B.I.frame in one setting. Carbide milling cutters are ←used in all operations.



MILLING MACHINE—*George Gorton Machine Co., Racine, Wis.* Super-speed milling machine with either a swivel or universal head, is listed as model O-16A. Operator can sit at machine in a normal position. It is a ram-type, hand-feed vertical milling machine with a heavy column. Standard spindle takes the Gorton taper collet and accommodates cutters to ½-in. shank dia.

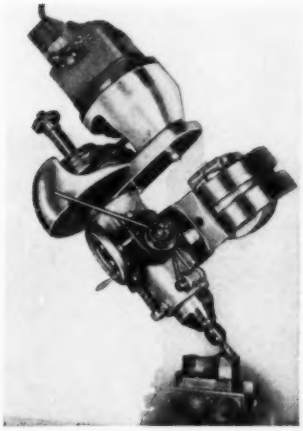
PANTOGRAPH MACHINE — *Mico Instrument Co., 80 Trowbridge St., Cambridge 38, Mass.* No. 252, 2- and 3-dimensional engraver is a portable pantograph machine designed to make small dies and molds for plastics, rubber, glass, die castings, templets or other similar forming operations.

GEARHEAD—*Olsen Industrial Products, 40 W. Water St., Wakefield 59, Mass.* Two-speed gearhead is attachable to a Bridgeport Miller Head, and is also adaptable to other types. Mechanism is mounted on top of pulley drive of miller. Ratios of 1 to 1 and 6 to 1 are possible.

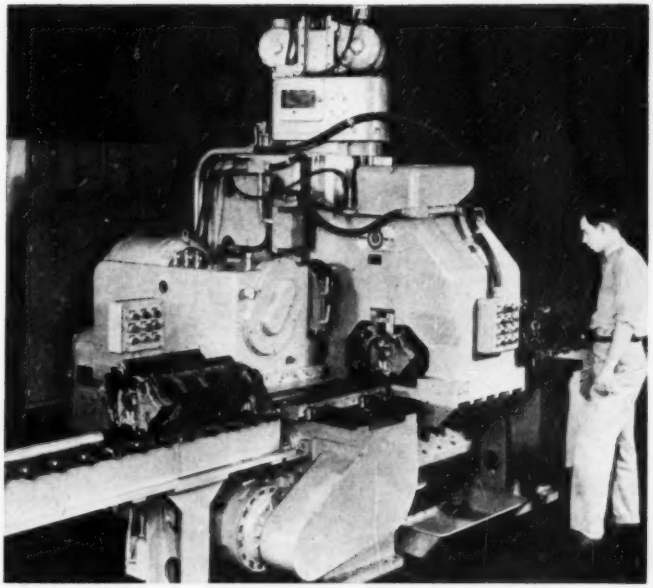


MILLING ATTACHMENT—*R. Hutchinson & Co., 163 Albany St., New Brunswick, N. J.* Vertical milling attachment for horizontal bench millers converts them for vertical milling operations. Attachment converts an Atlas Series M1, MF and MH milling machine or any bench miller with 1½-in. dia. overarm to vertical operation.

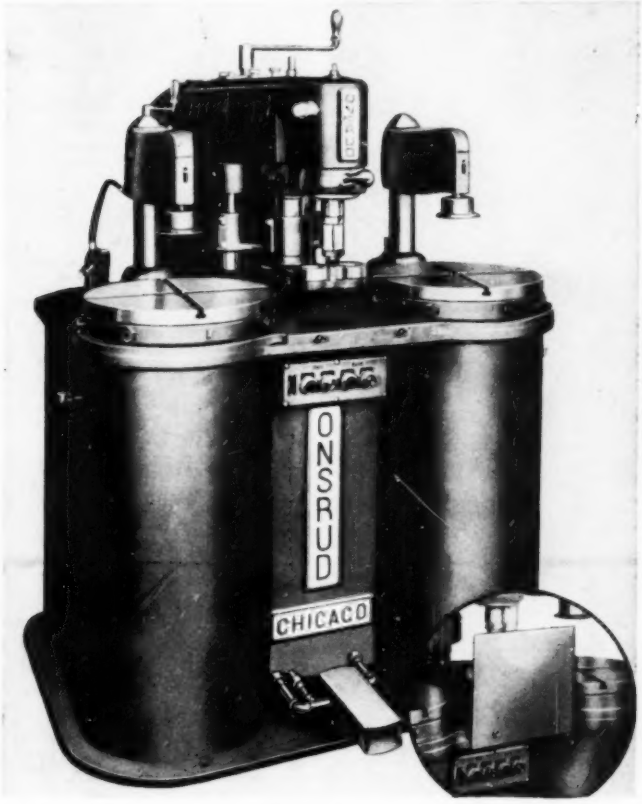
MILLING MACHINE—*Cosa Corp., 405 Lexington Ave., New York 17, N.Y.* SIP jig-boring and milling machine, type Hydroptic-7, has a table working surface of 61½x40½ in. The guaranteed accuracy of all table settings is 0.0002 in. The maximum distance from table top to spindle end is 38 in. Drilling capacity in cast iron is 2¾ in., and boring capacity with toolholder FS is 10 in. The range of the depth-measuring device is 12 in.



MILLING ATTACHMENT — *Rusnok Tool Works, 4840 W. North Ave., Chicago 39, Ill.* Rail-type mounting is offered for their milling attachment, which can be placed and locked in position within a full 180° adjustment. Brackets are fitted to milling machines with round overarm within range of 3- to 5-in. dia.

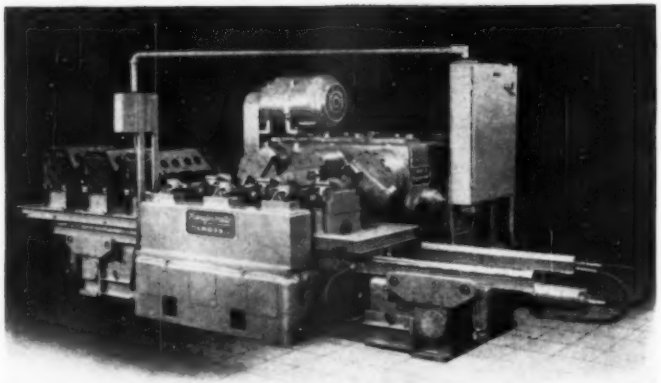


SPECIAL MILLING MACHINE — *Sundstrand Machine Tool Co., Rockford, Ill.* A special Rigidmil automatically mills both ends and main-bearing faces of an automotive cylinder block with a single clamping of work. The two 15-hp. horizontal, single-spindle heads have transverse feed on slideways at both ends of a rise and fall fixture to face-mill ends of block.

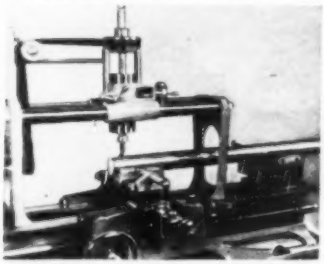


MILLING ATTACHMENT — *United States Machine Tool Co., Cincinnati 2, Ohio.* Universal milling attachment is equipped with two heavy-duty steel driving gears and a large idler gear to take the heaviest cuts within the capacity of the milling machine itself, yet operate silently.

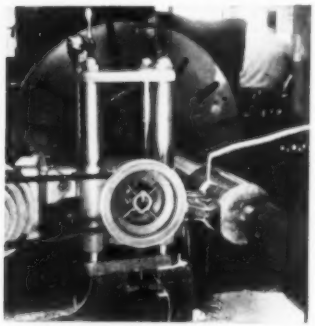
CONTOUR-MILLING MACHINE — *Onsrud Machine Works, Inc., 3921 Palmer Street, Chicago, 47, Ill.* Mass production of round, rectangular, or irregularly contoured parts to 18-in. over-all diameter is a continuous production operation with no interruption for setup on the new Onsrud A-18 rotary-table, contour milling machine.



SPECIAL MACHINE—*Cross Co., Detroit 7, Mich.* Cylinder-block assemblies are faced at the transmission joint, square with a crankshaft bore at the rate of 56 per hr. Transfer location and clamping are automatic, and three blocks are faced simultaneously by single-point carbide facing tools.

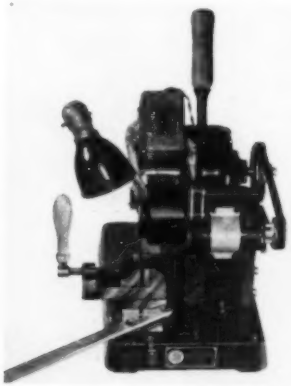


VERTICAL - MILLING ATTACHMENT—*Palmer Industries, Inc., 6149 South Sangamon St., Chicago 21, Ill.* Vertical-milling attachment can be applied to all makes of bench lathes. Compound of the lathe is removed, and vise slipped on in its place. Longitudinal feed and cross feed on the lathe are used in the same manner as on a milling machine.

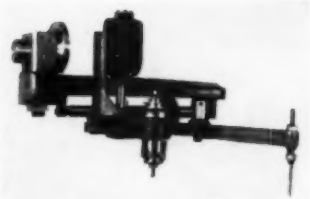


ATTACHMENT — *Versa-Mil Co., 50 Church St., New York 7, N.Y.* A machine-tool attachment, the Versa-Mil, is mounted on the carriage of a lathe and will perform such operations as milling keyways, gears and threads; drilling, reaming, boring, routing; grinding external and internal, cylindrical, and other surfaces.

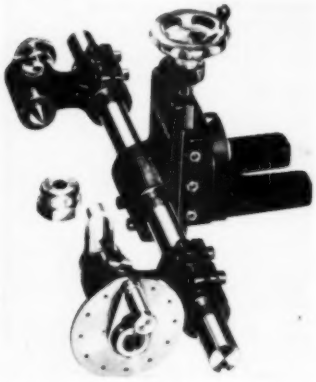
MILLING ATTACHMENT—*Bemis & Call Co., Springfield, Mass.* Precision horizontal-milling attachment is adjustable to almost any position, and handles precision milling, drilling, and boring at any angle, utilizing the original setup. It accommodates one or more cutters up to 4 in. in diameter.



HAND-MILLER ATTACHMENTS — *H. B. Rouse & Co., 2215 N. Wayne Ave., Chicago 14, Ill.* Attachments for the Rouse Hand Miller includes No. 7 vise which increases range. It is fitted with a specially slotted removable jaw allowing it to hold odd-shaped pieces. The No. 9 cast-iron safety cutter guard is also offered.

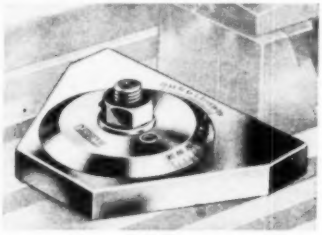


PROFILING ATTACHMENT — *Auto Engraver Co., Inc., 1776 Broadway, New York 18, N.Y.* Equipment, making possible the use of milling machines for 2-, and 3-dimensional profiling and contour milling is called the control-cut Multi-Graver. Attachment is capable of reproduction at 1:1 or at ratios of 2:1 to 4:1.



MILLING ATTACHMENT — *Chicago Tool and Engineering Co., 8383 S. Chicago Ave., Chicago 17, Ill.* Indexing and milling attachment for milling operations on engine lathes cuts gears, splines, keyways on circular pieces. Model No. 300 will take work to 4 in. in dia. and 11½ in. between centers. Vertical feed travel is 1½ in.

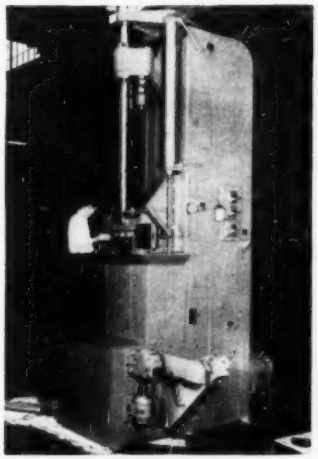
MILLING ATTACHMENT—*Tree Tool and Die Works, Racine, Wis.* All-angle milling-head attachment for milling, drilling, and boring is called the Model MH. It has eight speeds in two ranges, 140 to 3500 rpm., or 210 to 5200 rpm. Featured is an automatic collet closer. Feed can be engaged at any point of stroke. An inclosed micrometer depth stop is provided.



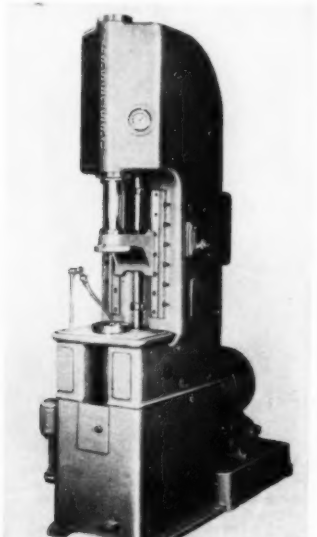
PROTRACTOR—*The Taft-Peirce Mfg. Co., Woonsocket, R.I.* Protractor for obtaining an angular locating or working surface on milling machine or other machine tables has graduated index plate with vernier scale for accurate settings within 5 min. of angle.

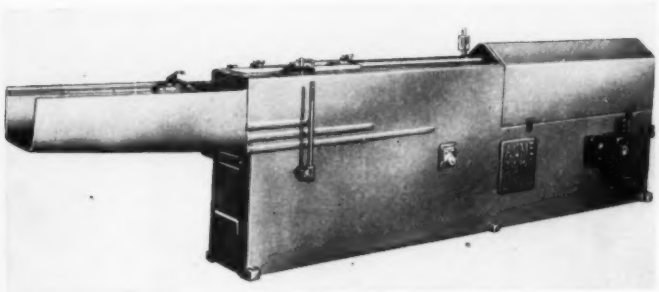
AMERICAN MACHINIST 36th ANNUAL REVIEW

Broaching

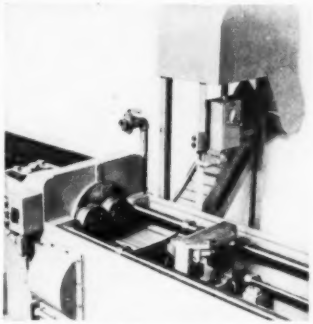


BROACHING MACHINE—*The American Broach & Machine Co., Ann Arbor, Mich.* Vertical pull-up internal hydraulic broaching machine has an over-all height of 16 ft. 10 in., a gross weight of over 17 tons, a normal-operating capacity of 30 tons, and a broaching stroke of 60 in. Machine was designed to broach involute splines in gear blanks.





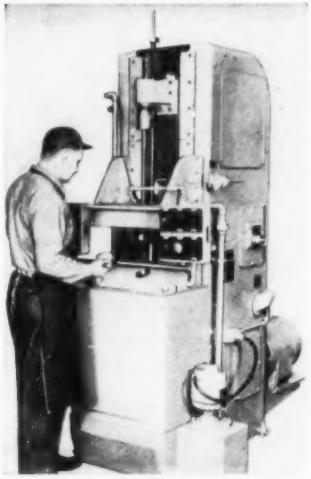
BROACHING MACHINE—*The Acme Broach Corp., E. Third St., at Delaware, Lexington 47, Ky.* Horizontal hydraulic broaching machines built in 6-, 10-, 15-, and 20-ton capacities have a 54-in. stroke. Machines will handle broaches to 60 in. long. Featured is an adjustable sliding head.



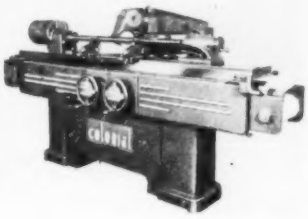
BROACHING MACHINE—*The Colonial Broach Co., Box 37, Harper Station, Detroit 13, Mich.* Universal horizontal broaching machine incorporates both an automatic broach-handling mechanism and a parts ejector conveyor interlocked with the machine cycle.

BROACHING MACHINE—*Greenerd Arbor Press Co., Nashua, N. H.* The G6-S-W-C broaching and guided-assembly press is a self-contained machine designed as a rugged, rigid press with a minimum of deflection for broaching and assembling requiring accurate alignment. It is used for wet or dry broaching, assembly and die ←work.

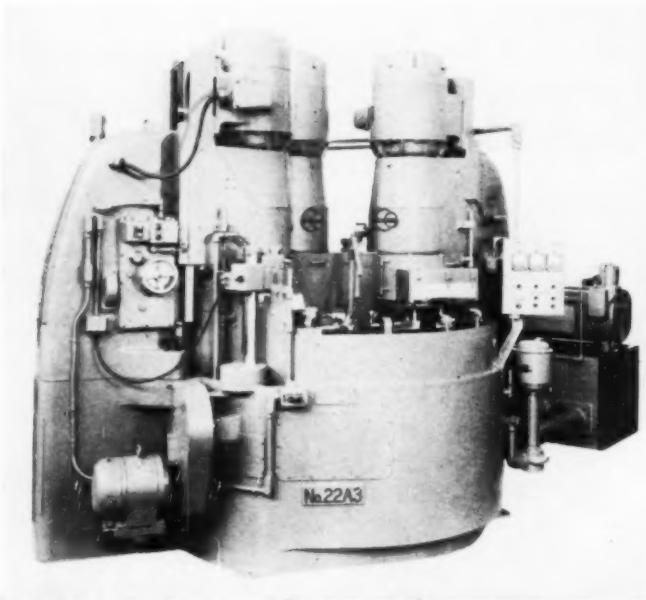
BROACH SHARPENERS—*The Colonial Broach Co., Box 37, Harper Station, Detroit 13, Mich.* Line of broach sharpeners, comprising seven basic models, includes two sizes of machines for sharpening round broaches; and two sizes which will handle both flat and round broaches. →



BROACHING MACHINE—*The American Broach & Machine Co., Ann Arbor, Mich.* Model VP-2-8-24 vertical pull-up hydraulic broaching machine is for high-production internal broaching of small parts. Electrical controls are arranged to complete one full cycle on semi-automatic operation. Machine has a normal broaching capacity of 8 tons.

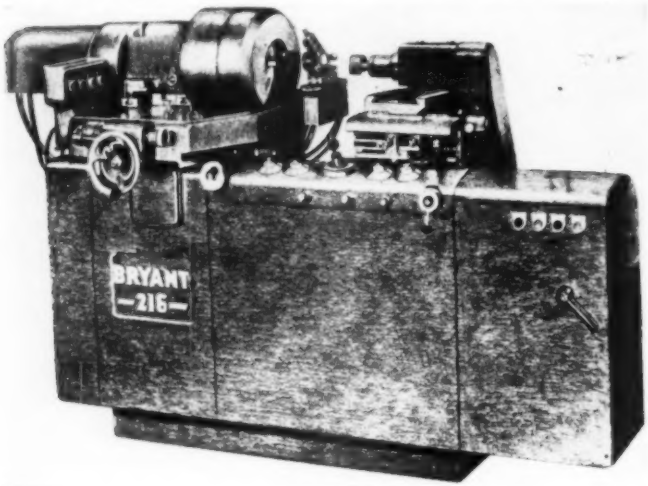


Grinding, Honing, Lapping

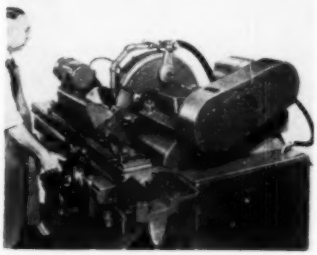


AUTOMATIC SURFACE GRINDER—*The Blanchard Machine Co., 64 State Street, Cambridge 39, Mass.* An automatic surface grinder No. 22-A3 has three wheels 22x4x16 in. and a worktable of 68-in. O.D., and 49-in. I.D.

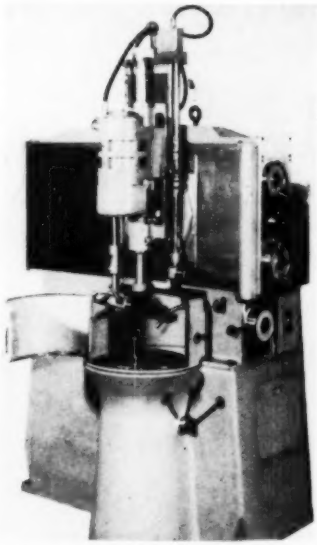
GRINDER—*Bryant Chucking Grinder Co., Springfield, Vt.* No. 216 automatic hydraulic internal grinder for high-production work, is provided with a 16-in. swing inside the standard water guard, 15-in. wheel-slide traverse.



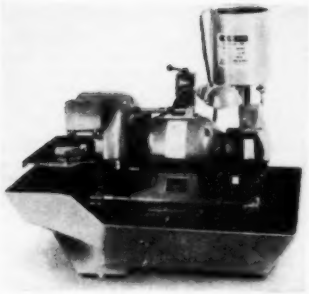
SNAGGING GRINDER — *Standard-Electrical Tool Co., 2480 W. Sixth St., Cincinnati 4, Ohio.* Redesigned twin-motor variable-speed snagging grinder, No. 35, is a 2-in-1 machine. One side of the machine can be stationary while the other wheel is operating. It has two independent spindles and two 7½-hp. motors.



GRINDING MACHINE — *Brown & Sharpe Mfg. Co., Providence, R.I.* No. 10 and 12 plain grinding machines now are available with a 10-in. swing. Machines are designed for rapid cylindrical grinding of small- and medium-sized parts to close limits on a production basis.

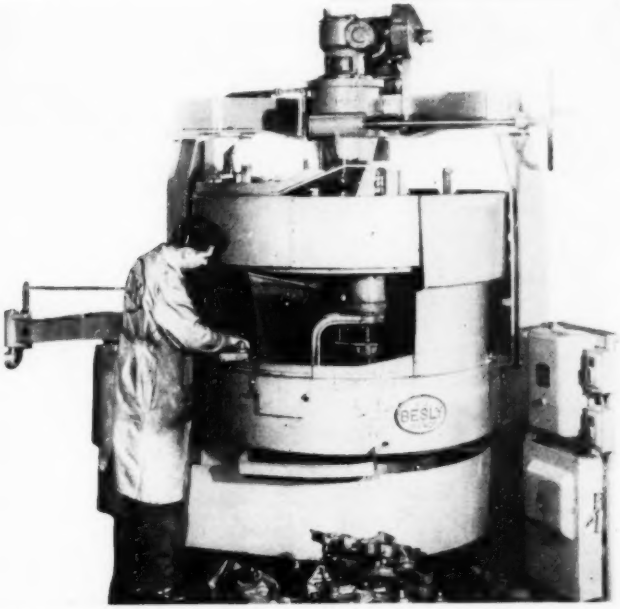


GRINDERS—*The Springfield Machine Tool Co., Springfield, Ohio.* Vertical universal grinders are hydraulically operated and offered in two sizes with swing capacities to 32 in. in diameter and nominal grinding capacities of 24 in. in diameter.

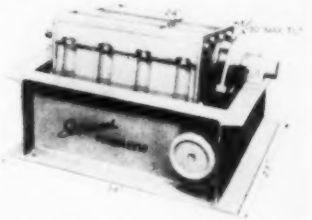


GRINDER — *Scheer Grinder Co., Collingswood, N. J.* No. 2 off-hand grinder grinds carbide and high-speed steels. Featured is the method of handling coolant. Grinder includes a coolant tank, settling basin and pump section. Coolant is directed through wheel body and presented to point of grinding contact from interior of wheel.

GRINDER—*Landis Tool Co., Waynesboro, Pa.* Multiple-wheel plain hydraulic grinding machine known as the 10x30-in. Type CH-IW, carries a multiplicity of wheels on a spindle between the bearing supports. Many diameters can be ground on the same shaft simultaneously. Diameters being ground do not have to be straight. Machine has a maximum work swing of 10 in.

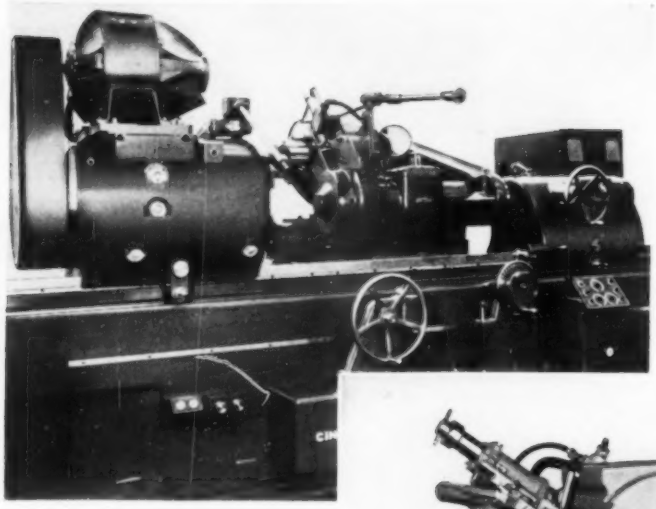


GRINDER—*Chas. H. Besly and Co., 118-124 N. Clinton St., Chicago 6, Ill.* Vertical-spindle grinder, No. 372-72 in., features power-driven rotary fixture into which the casting is placed. Rotating fixture and revolving work holders carry castings through grinding cycle at a speed of 1 rpm. Four pieces are ground simultaneously, removing approximately 1/32 in.



MAGNETIC TILTING FRAME — *Stearns Magnetic Mfg. Co., Milwaukee 1, Wis.* Tilting frame is auxiliary equipment for grinder holding magnets designed to grip castings and other material. Tilting frames allow for positioning work in a 30° arc, and are designed to accommodate grinder holding magnets of 16x14 in., 16x24 in. and 16x40 in.

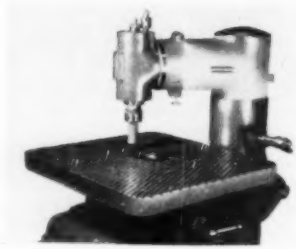
GRINDER—*Samuel C. Rogers & Co., 183-205 Dutton Ave., Buffalo 11, N. Y.* Grinder handles knives up to 160 in. long. The heavy-duty machine listed as Type NT-160, handles chipper knives, paper knives and doctor blades used in the paper industry and printing trades. →



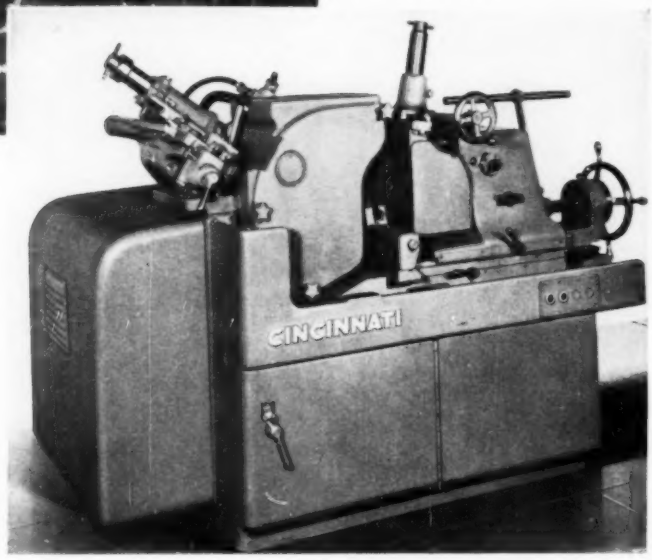
ROLL-GRINDING MACHINES—*Cincinnati Milling and Grinding Machines, Inc., Cincinnati 9, Ohio.* Improved Cincinnati Filmatic 20-, 24-, and 28-in. heavy-duty traveling-table roll-grinding machines have electronic table traverse providing an infinite ←number of traverse rates.

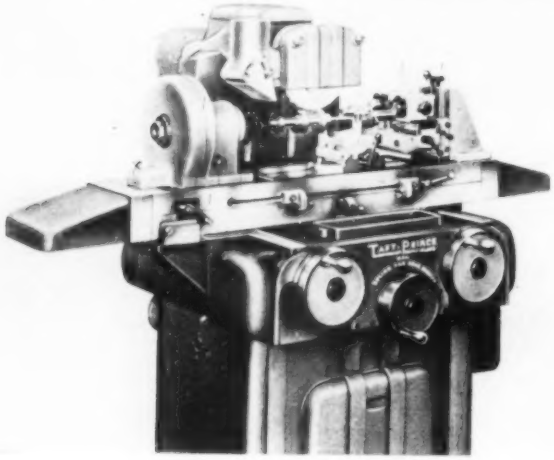
GRINDER—*Standard Electrical Tool Co., 2480 W. Sixth St., Cincinnati 4, Ohio.* Heavy-duty grinder, part of the Cadet line, is a 7½-hp., 20-in. machine, Type 70FAS, with 1150-rpm. motor for 20x3-in. grinding wheels.

ANGLE PLATE—*Taft-Peirce Mfg. Co., Woonsocket, R.I.* Magnetic angle plate is designed for work requiring either single- or compound-angle setups. Adaptable for use on the T-P No. 1 precision surface grinder, it can be used with any grinder, with or without a magnetic chuck.



COLLET CHUCK — *Boyar-Schultz Corp., 2110 Walnut St., Chicago 12, Ill.* No. 2 profile grinder has an improved method for holding grinding wheels. A specially designed double-taper collet chuck is attached to the top of the spindle. The chuck accommodates collets in sizes from ⅛ to ⅝ in. in steps of ⅛ in.





CENTERLESS GRINDER — *Cincinnati Grinders, Inc., Cincinnati, Ohio.* Filmatic No. 2 centerless grinding machine has improved features said to promote safety and facilitate setting up. Other features include straight hydraulic grinding-wheel truing, with arrangement for cam-controlled profile truing. There are 12 speeds from 12 to 300 rpm. Capacity of machine with standard workrests is 1/16- to 3½-in. diameter.

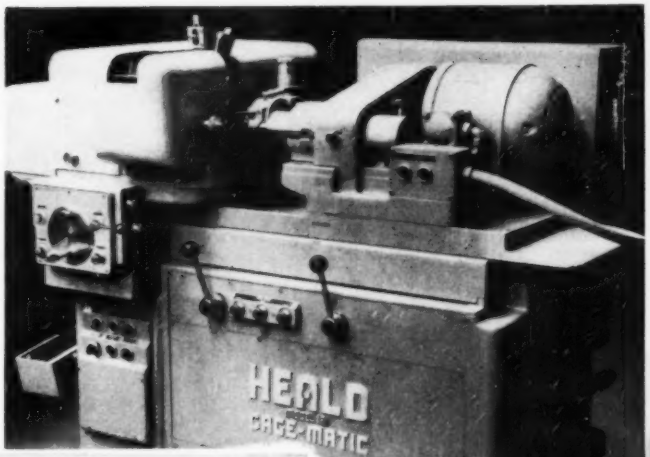
GRINDER—*Torq Electric Corp., 1071 Interstate St., Bedford, Ohio.* Bench-type ¼-hp. grinder for grinding, buffing, tool sharpening, polishing, wire brushing, and light production and toolroom work, is furnished with two 6x¾-in. wheels, one coarse, one fine. Adjustable toolrests permit contact with the wheel at desired angle.

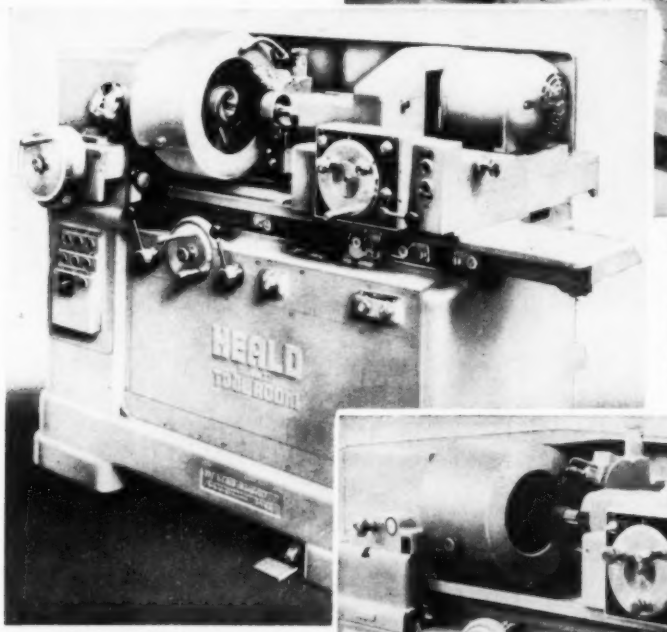
SPLINE, GEAR GRINDER — *Taft-Peirce Mfg. Co., Woonsocket, R.I.* Semi-automatic grinder produces small-, medium-size fine-pitch gears and splines to close tolerances. Net clearance from center line of work arbor to table surface is 4½ in. Distance between cen-←ters can accommodate 8-in. arbor.

INTERNAL GRINDER — *The Heald Machine Co., Worcester 6, Mass.* Model 171 chuck-type internal grinder for work up to 2 in. I.D., is designed for small work and large-lot production, and is available with both Size-Matic and Gage-Matic features for automatic sizing. A single switch converts from one method to the other. Grinders can be furnished with the Size-Matic method alone.

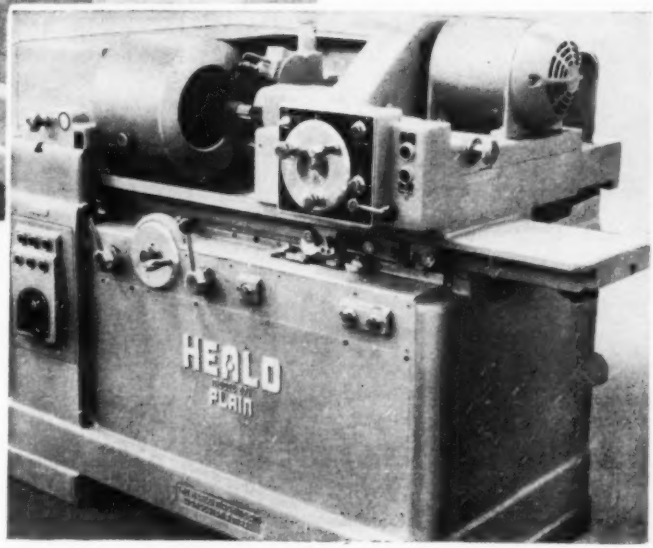
GRINDING ATTACHMENT—*Detroit Reamer and Tool Co., 2830 E. Seven Mile Rd., Detroit 12, Mich.* Circularity grinding attachment for grinding form relief, radial relief or both at once, will fit on any cylindrical or cutter grinder. As the spindle revolves, a cam generates the relief in the tool.

BENCH BACKSTAND — *Hammond Machinery Builders, 1600 Douglas Ave., Kalamazoo, Mich.* Bench backstand, model 6-B, has an 8-in. diameter by 4½-in. face dynamically balanced aluminum pulley for up to 4 in. wide abrasive belts.



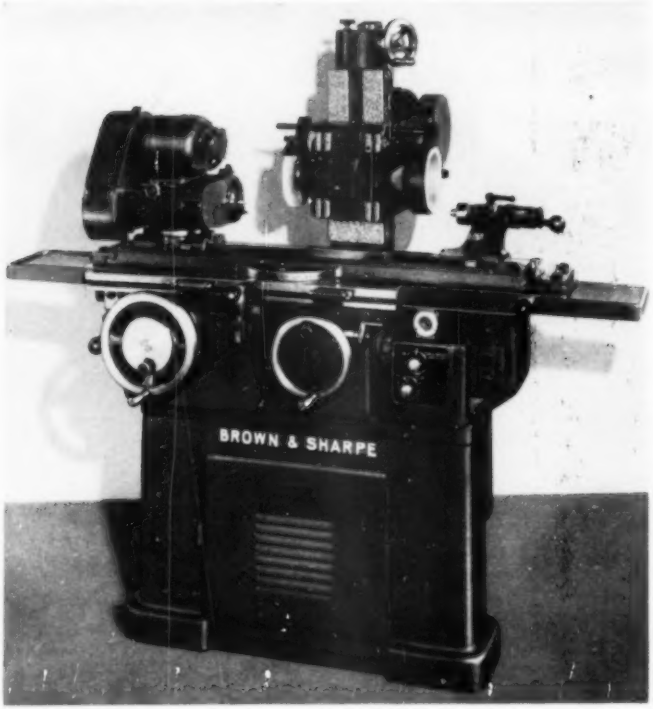


INTERNAL GRINDER—*The Heald Machine Co., Worcester 6, Mass.* Automatic centerless internal grinder, for work to 4-in. O.D. which can be rotated on its outside diameter, is listed as Model 181. Every element of the grinding cycle including loading and unloading is automatic. Amount of infeed diminishes from roughing through finishing feed according to pre-set rate.



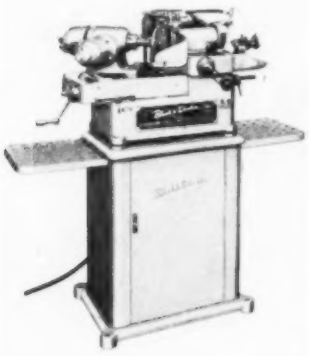
INTERNAL GRINDER—*The Heald Machine Co., Worcester 6, Mass.* Model 271 toolroom internal grinding machine embodies features common to new Heald line. Workhead can be swiveled providing wide angular capacity for tapper work. Sine-bar attachment for high-precision settings can be applied. Semi-automatic grinding cycle makes it possible to handle small-lot production runs.

INTERNAL GRINDER—*Heald Machine Co., Worcester 6, Mass.* Plain internal grinding machine, Model 271, is made for small- to medium-lot production where an automatic cycle is not required. Swing over table is 18 in.; max. length of hole that can be ground is 5 in.; table travel is 16 in. Table speeds are unlimited between 0 and 35 fpm. →



TOOL GRINDER—*Brown & Sharpe Mfg. Co., Providence 1, R.I.* Redesigned No. 13 universal and tool grinding machine is driven by three constant-speed motors; 1 hp. for wheel spindle, ¼ hp. for table, and 1/6 hp. for headstock. Six rates of table feeds, from 7½ to 100 ipm. are selected from the front of the machine.

GRINDER—*Brown & Sharpe Mfg. Co., Providence, 1, R.I.* Cutter- and tool-grinding machine, No. 5, handles toolroom sharpening jobs of the smaller class, especially end mills. Spindle-slide upright has 4½-in. transverse movement; 3-in. longitudinal adjustment. Wheel-spindle slide has vertical adjustment of 5½ in.



VALVE, TOOL GRINDER — *Black and Decker Mfg. Co., Towson 4, Md.* No. 6 universal valve and tool grinder handles Flat-head and 15° valves without special attachments. Valve-stem capacity ranges from ¼ to 1¼ in. and the valve-head capacity ranges to 5¼ in. Large diesel valves are adaptable to the grinder.

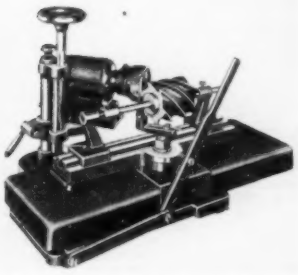
GRINDER—*H. Leach Machinery Co., Providence, R.I.* Compact, self-contained 6x12x10½-in. surface grinder has two-speed ball-bearing spindle. Motor is driven by ¾-hp. motor. Grinder features standard 5x10-in. magnetic chuck, 7x½x1¼-in. wheel.

CHIP-BREAKER GRINDER — *Hammond Machinery Builders Inc., Dept. GP-30, 1600 Douglas Ave., Kalamazoo, Mich.* Model C-4 chip-breaker grinder features a vise with four swivels, each equipped with a dial graduated in degrees, permitting the setting of tools at any desired angle. Machine handles box and single-point tools to 2 in.

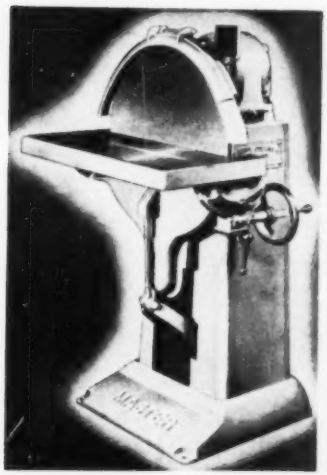
SURFACE GRINDER — *Covel Mfg. Co., Benton Harbor, Mich.* Hand-feed surface grinder for grinding tools, dies, chip breakers, and other toolroom jobs is called Excel No. 7. Working surface is 5⅝x10⅝ in.; longitudinal travel, 12 in.; cross travel, 6⅛ in.

DRILL GRINDER—*Gallmeyer & Livingston Co., Grand Rapids, Mich.* Model CWA double-holder twist-drill grinding machine sharpens standard 2-, 3-, and 4-in. flute drills of either straight-shank or taper-shank type at the standard 59° angle. Machine has a capacity for sharpening twist drills from No. 52 to 2½ in. Drills can be ground dry on one side of machine, wet on other.

CUTTER, TOOL GRINDER—*Cincinnati Milling Machine Co., Cincinnati 9, Ohio.* Improved No. 2 cutter and tool grinder has table-traverse control now located at the front and left-hand corner of the bed; behind the table, and right-, and left-hand side of the bed. Vertical adjustment of the grinding-wheel head has been increased 3 in. to a total of 10½ in.



CUTTER GRINDER—*Carlson Brothers Tools & Engineering Co., 2647 Coyle Ave., Chicago 45, Ill.* Universal cutter grinder called the Carlco was formerly the Hilco Universal Cutter Grinder, made by Berco Mfg. Co. of Chicago. The machine features a 9-in. horizontal movement of the carriage and a 6-in. vertical movement of motor.



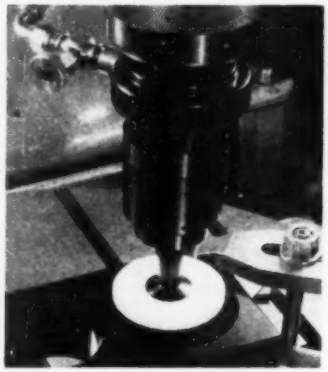
DISK GRINDER—*The Kindt-Collins Co., 12653 Elmond Ave., Cleveland 11, Ohio.* A 24-in. Master disk grinder can be adjusted by means of a counterbalanced table which moves up or down 11 in. by hand pressure to any desired position. A reversible disk for right- or left-hand jobs is offered.

GRINDER—*Hisey-Wolf Machine Co., Cincinnati 25, Ohio.* Grinder grinds points on flat beaded drills which are used for tough metals. Holder on the left side of the machine grinds the point while the holder on the right side is used for thinning the web. Machine will handle flat drills from ½- to 2-in. dia.

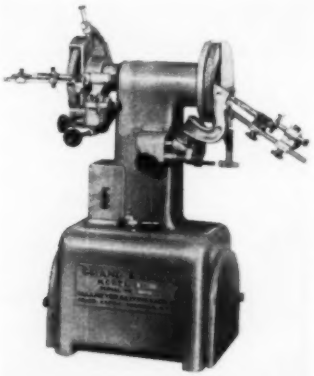
GRINDERS—*The Hisey-Wolf Machine Co., Cincinnati 25, Ohio.* One and 2-hp. precision internal and external grinders are redesigned. Sizes 1 and 2 hp. offer a change in the motor mounting. An adapter base for the motor is now supplied with flat key and keyway between the adapter and main frame casting.

GRINDER-DUST COLLECTOR — *Hammond Machinery Builders, Inc., Kalamazoo 54, Mich.* Self-contained grinder and dust collector, the No-Dust grinder is for intermittent-grinding operations. Three models are available for 10-, 12-, and 14-in. wheels. Three Fiberglas filters are used to remove the finer particles.

BENCH GRINDER—*Stanley Electric Tools, New Britain, Conn.* No. 266, ¼-hp. bench grinder is suited for light grinding, sharpening tools, general grinding, buffing, polishing, and wire-brush work. The constant-speed induction motor can be used for continuous operation. It is furnished with two wheels, 6x2 in., one coarse, one fine.



JIG GRINDING ATTACHMENT — *The Vulcan Tool Co., Dayton, Ohio.* Series 20,000 Vulcanaire is designed for jig grinding holes in hardened steel with diameters ranging from 1½ to 4 in. max. It is an air-driven attachment which can convert jig borers and other machine tools into precision jig grinders.

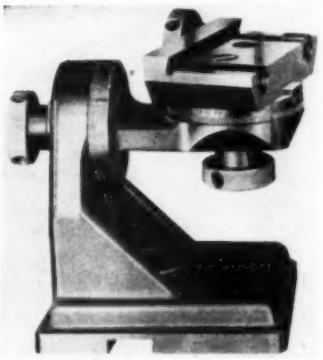


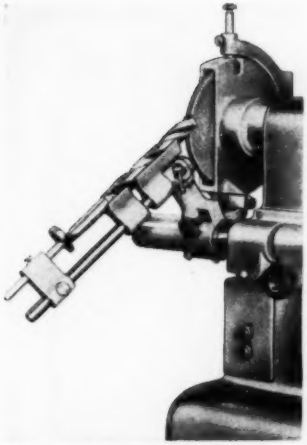
TAP, DRILL GRINDER—*Gallmeyer & Livingston Co., Grand Rapids, Mich.* Line of Grand Rapids combination tap and drill grinders is offered. The Style BD-1 machine, illustrated, has a capacity for sharpening taps from No. 6 to 1½ in., and twist drills from ⅛ to 1½ in. Either right- or left-hand 2-, 3-, and 4-flute taps can be sharpened.

GRINDING FIXTURE—*Landis Machine Co., Waynesboro, Pa.* No. 15 grinding attachment for Landis chasers grinds, on the tangential chaser, the compound rake and lead angles, necessary for threads. Platen can be rotated throughout a 360° circle horizontally. Fixture can be used on all Landis chasers to 1¼ in. wide. →

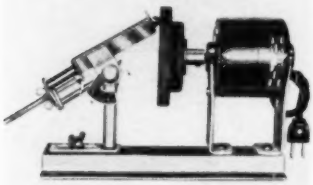
SALVAGING MACHINE — *Wickes Bros., Saginaw, Mich.* Grinding-wheel salvaging machine is capable of handling grinding wheels up to 42 in. in diameter and 14 in. thick. The outside diameter can be turned down, sides can be turned down, or the bore enlarged.

FLUTE GRINDER — *The Wardwell Mfg. Co., 3167 Fulton Rd., Cleveland, Ohio.* No 90FS automatic universal flute grinder grinds spiral flutes from solid in tools, such as drills, as small as 1/16-in. dia., spiral- or straight-taper reamers, and spiral- or straight-milling cutters and end mills. Machine has an automatic index feed, and an automatic feed of the grinding wheel.



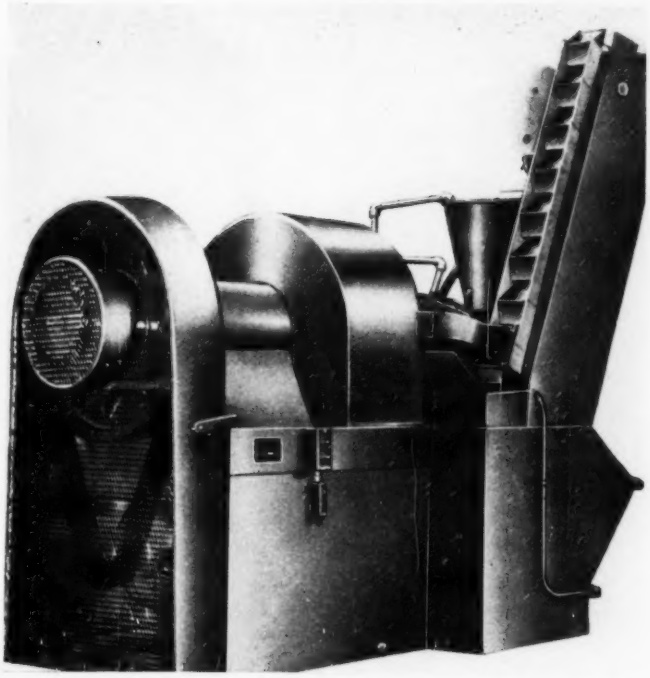


POINT THINNER — *Gallmeyer & Livingston Company of Grand Rapids, Michigan.* Point thinner for any of the new series T drill grinders will taper worn drill webs to the exact angle required for maximum drilling efficiency.



DRILL GRINDER—*The EZ Manufacturing Co., 4408 San Fernando Road, Glendale 4, Calif.* Drill grinder for sharpening drills in 30 sec., is offered with a protractor fixture and an adjustable spacer for various lengths of drills. The drill sharpener is priced at $22.50 complete.

GRINDER—*Gallmeyer & Livingston Co., Grand Rapids, Mich.* Model 2D-1 tap grinder with a capacity from No. 6 to 3-in. taps is a double-end spindle type and grinds two taps simultaneously on the two wheels. Grinder will grind taps with two, three, four, five, or six flutes.



GRINDING FIXTURE — *Erickson Tools Div., 2309 Hamilton Ave., Cleveland 14, Ohio.* Grinding fixture illustrates the use of Erickson expanding mandrel for holding jobs. Faceplate mandrel No. 18-A-1, holds major diameter of an Acme thread on the inside diameter. Drawbar-operated mandrel is equipped with locators.

TUBE-DEBURRING MACHINE — *Pines Engineering Co., Aurora., Ill.* High-production, manually operated, bench-type tube and rod end-finishing machine is semi-automatic and can be used for deburring, inside and outside chamfering, facing, center drilling, flaring, beading, drilling, reaming, and single-point boring on tubes and rods in any length up to 2 in. in dia.

BALL MACHINES—*Koehler & Sons, Summer Ave., Horsham, Pa.* Automatic ball machine will flash, grind or lap either low-carbon or alloy-steel balls maintaining close tolerances. Machines are available in three sizes: 24, 30, and 36 in., taking ball sizes from 1/16 to ½ in., ¾ to ⅞ in., and ⅞ to 1½ in.

DUST SEPARATOR—*Industrial Electroplating Co., Inc., 219 W. Vermont St., Indianapolis 4, Ind.* Niehaus dust separator employs water action to remove from the air dust and foreign particles resulting from polishing, buffing, and grinding operations.

SELF-CONTAINED AUTOMATIC FILTER-CLEANER UNIT — *Aget-Detroit Co., 387 Main at Washington, Ann Arbor, Mich.* Is for use in connection with its standard model 1150 Dustkop dust collectors. The automatic self-cleaner removes lint by suction from the inner surface of the filter.

DUST COLLECTOR — *Aget-Detroit Co., 396 Main at Washington St., Ann Arbor, Mich.* Portable self-contained dust collector for collecting dust from small wheel grinding and sanding, and lint from buffing and polishing operations, listed as the Model 335 Dustkop, can be used for continuous work on production operations. Over-all size is 12x14x18 in.

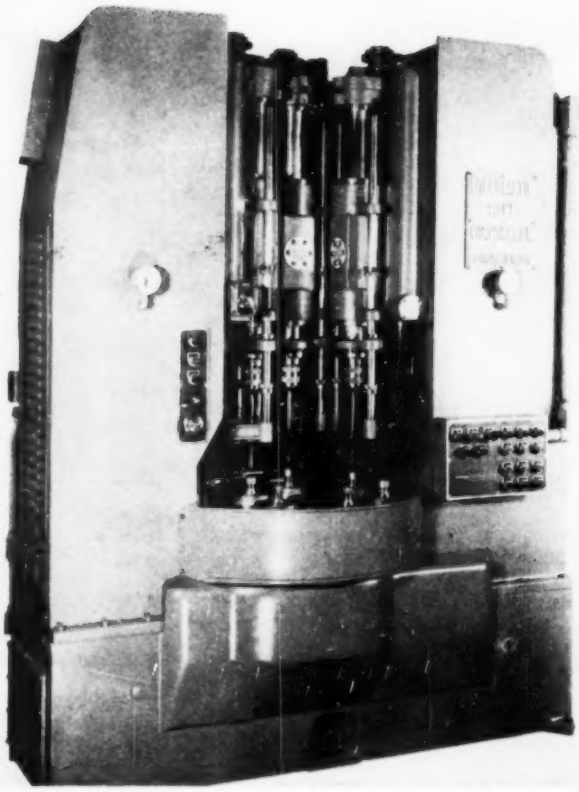
SINGLE-SPINDLE MACHINE — *C. Allen Fulmer Co., Cincinnati 2, Ohio.* Small-size, single-spindle, hydraulic honing machine, model 412, handles internal cylinder diameters from ½ in. to 4 in. Maximum stroke is 12 in. Reciprocating speeds up to 80 fpm are possible.

LAPPING MACHINE—*Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill.* High-production lapping machine listed as the Lapmaster, handles work in one operation of different sizes, shapes and heights. The machine uses a continuously agitated compound tank and alloy-iron lapping plate.

DUST COLLECTOR — *Aget-Detroit Co., Ann Arbor, Mich.* Self-contained Dustkop dust collector with a large-volume dust-storage capacity, Model 11B50, employs a roll-a-way bin with clamp-down cover. Actual suction capacity on a 6-in. inlet is 1394 cfm. at 3.2 static suction.

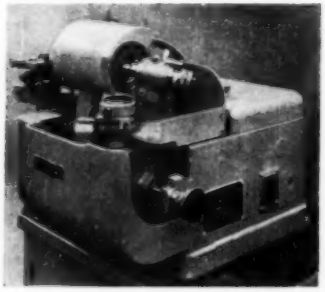
DUST COLLECTOR—*Aget-Detroit Co., Ann Arbor, Mich.* Model 11D50 Dustkop for operation on 25-cycle power is added to the line of self-contained dust collectors. A special motor mounting for an over-drive is used to maintain normal fan speed. This permits development of over 1300 cfm. suction on a 6-in-dia. inlet with 3-in. water lift.

DUST COLLECTOR—*Torit Mfg. Co., St. Paul 2, Minn.* No. 68 dust collector providing a 4 to 1 filter velocity (4 cfm. through each square foot of filter cloth), uses twenty filters each measuring 18x16 in. Unit develops 320 cfm., air velocity 6700 fpm., static pressure 4 in., through one 3-in. inlet.



MICROHONING MACHINES — *Micromatic Hone Corp., Detroit, Mich.* Heavy-duty multiple-spindle microhoning machines called Hydrohoners give the power and control necessary to hold size and finish to close tolerances. Spindles are mounted in quills which in turn are actuated as independent units. By interlocking control panels, operation is automatic.

HONING MACHINE—*Staples Engineering Co., Birmingham, Mich.* Model B-3 will hone parts ranging from ¼- to 4-in. I.D. A machined surface is provided for mounting work-holding fixtures. For production work, parts are held in a fixture and stroking is by hand.



SHARPENER — *Heald Machine Co., Worcester 6, Mass.* Model 2 tool sharpener is designed to automatically lap sharp edges to correct shapes. After adjustment for desired shape, operator inserts tool in holder, flicks switch and tool is sharpened automatically.

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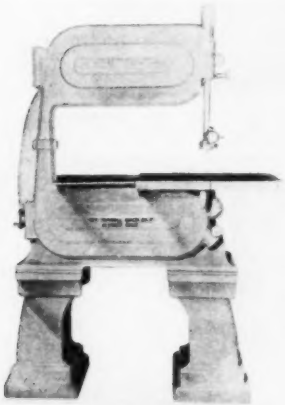
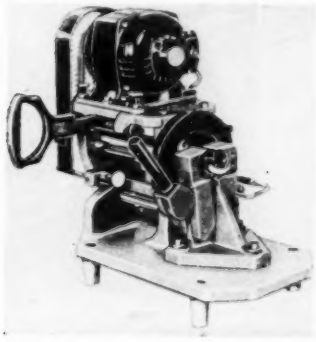
Cutoff and Filing

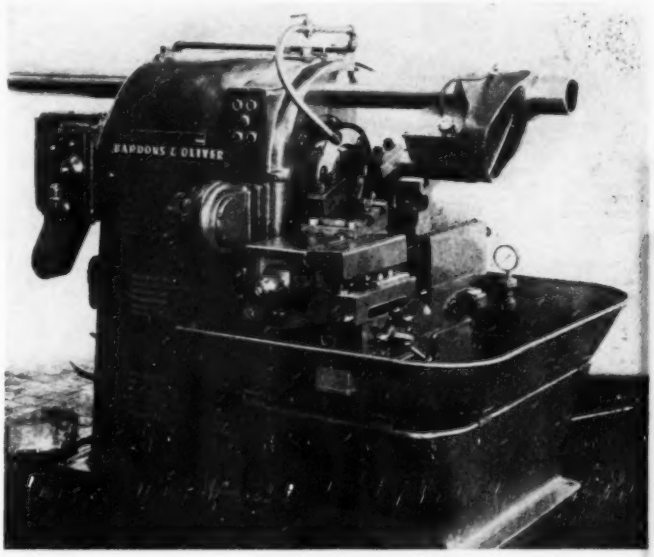
SLITTING SAWS—*Reltool Corp., 712 W. Michigan St., Milwaukee 3, Wis.* Plastics slitting saw for plastics and soft, tenacious metals, is hollow ground with a dish clearance on the sides to reduce friction and galling and generate less heat.



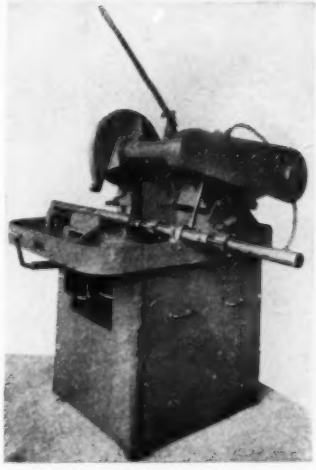
BAND SAW—*T. Farrell Machine Co., Berkeley, Calif.* Deep-throated four-wheel metal-working band saw has a cutting capacity of 27x12½ in. The 18x24-in. table tilts 45° right or 10° left. An auxiliary table of 16x18 in. is furnished. Blade speeds on the standard model are 550, 1059, 1750, and 2700 fpm.



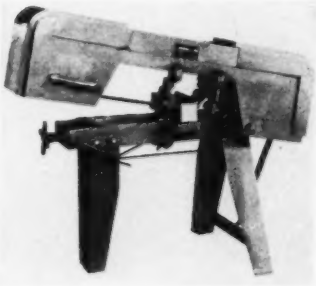
TUBE-CUTTING MACHINE—*C. J. Unger Mfg. Co., Dayton, Ohio.* Electric tube-cutting and flaring machine cuts, flares, and trims copper or aluminum tubing in one operation. Machine handles any length of tubing in sizes from ¼-in. O.D. to ⅝-in. O.D. Tubing does not turn.



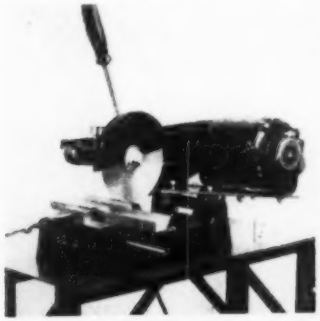
CUTTING-OFF MACHINE—*Bardons & Oliver, Inc., Cleveland, Ohio.* No. 35 Hydra-electric cutting-off machine is for chamfering and cutoff work on tubing, pipe or solid bar stock. Stock is fed through the hollow-spindle by a motor-driven feed. Two hydraulically operated cut-off slides, one front and one rear, are connected by an equalizing mechanism. Collet chuck has a capacity of 5½ in.



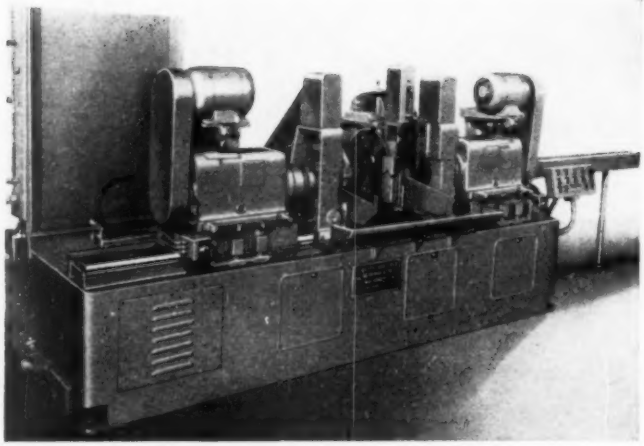
CUTOFF MACHINE—*The Tabor Mfg. Co., 6225 Tacony St., Philadelphia, Pa.* Machine for cutting brass, bronze, and steel in bar stock, tubing, angles and flats features a quick-acting clamp, and a handwheel for adjusting start of tension. Coolant is fed to both sides of wheel at hub, then thrown centrifugally at cut.



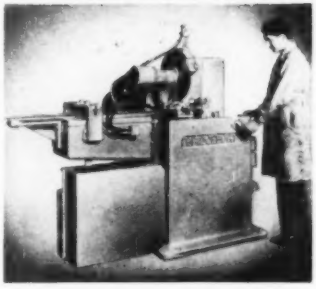
BAND SAW—*Johnson Mfg. Corp., 624 Chrysler Bldg., New York 17, N. Y.* Horizontal band saw, the Model B metal cut-off band saw, is designed to cut metals up to a capacity of 5x10 in. The bed is 7x28 in. Machine operates and shuts off automatically. There are three blade speeds: 45, 90, and 150 fpm.



CUT-OFF MACHINE — *Approved Devices Co., 525 Woodward Ave., Detroit 26, Mich.* Model No. L1 cut-off machine will cut aluminum, brass, brick, rod, drills, ebonite, and many other materials. It is a portable, light-duty cut-off machine and will cut at any angle with a special attachment.

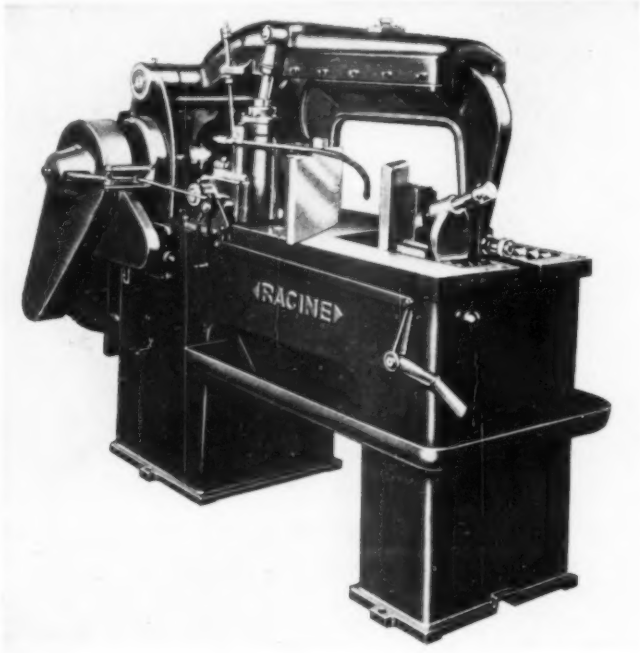


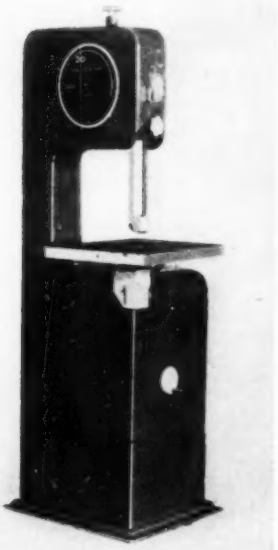
CUTOFF MACHINE—*The Bridgeport Safety Emery Wheel Co., Stratford, Conn.* Automatic abrasive cutoff machine is for high-speed cutting of stock up to 2-in. square to lengths ranging from ¼ to 12 in. Steel, brass, plastics, porcelain, and other materials can be cut. Listed as model No. 51, the machine has an 18-in. abrasive cutoff wheel. →



TRANSFER MACHINES—*Motch & Merryweather Machinery Co., 715 Penton Bldg., Cleveland 13, Ohio.* Four double-end transfer machines are offered. Workpiece is sawed to length and transferred to position for machining both ends while the second piece is being cut off. Four sizes available are: No. O-T-2 for 1¼-in. solid stock or 2-in. tubing; No. O-T-3 for 3-in. solid or tube stock; O-T-4 for 4-in. solid or tubing; 2-T-6 for 6-in. solid or tubing.

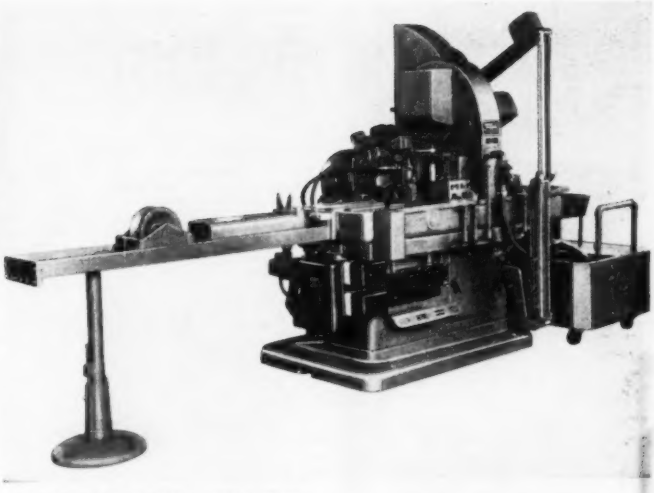
SAW—*Racine Tool & Machine Co., Racine, Wis.* Hydraulic metal-cutting saw handles all types of metal in all sizes to 10x10 in. Feed and pressure control, rapid traverse and lift on the non-cutting stroke are hydraulically operated. ↓





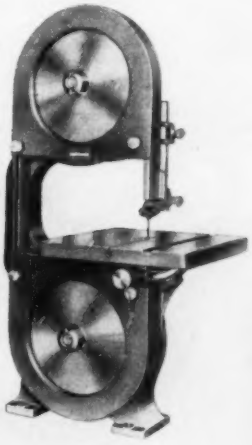
SAWING MACHINE—*The DoAll Co., Des Plaines, Ill.* Series of mass-produced, full-size sawing machines is offered. This 16-in. convertible model permits the use of as much as needed. The models range from the basic single-speed saw to a machine with double-range variable-speed control.

CUTOFF MACHINE—*Fox Grinders, Inc., Oliver Bldg., Pittsburgh 22, Pa.* Fox swing-frame cutoff machine designed for the flexible-type cutoff wheels, removes sprues and risers from bronze, aluminum, and iron castings. Having maneuverability through 180°, the cutoff machine No. 10-C accommodates wheels 16x5/32x1 in.

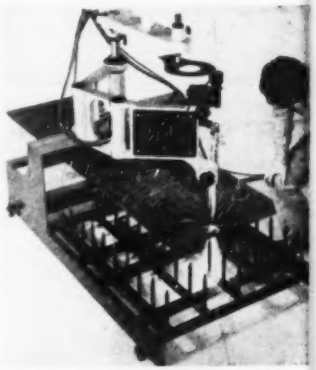


ABRASIVE-CUTTING MACHINE—*Andrew C. Campbell Div., American Chain & Cable Co., Inc., Bridgeport 2, Conn.* The Model 470 automatic abrasive-cutting machine features an oscillating head. Machine is sequence timed, eliminating adjustment of the timing cycle. The Model 470 will cut materials up to 6-in. dia., solid stock.

BAND-SAWING MACHINE — *DoAll Co., Des Plaines, Ill.* Diamond band-sawing machine cuts hardened steel, tungsten carbide, stone and vitreous materials directly to a layout line. Material removed is said to be in a salvageable form. Machine has a 16-in. throat depth and a 10-in. work-thickness capacity.



BAND SAW — *Foster Manufacturing Company, 1 Kinsey Ave., Buffalo 17, N. Y.* Band saw has a 33½-in. over-all height and a tilt table 50° through zero to 45°. The 12-in. wheels are crowned with oil- and wear-resistant rubber tires.



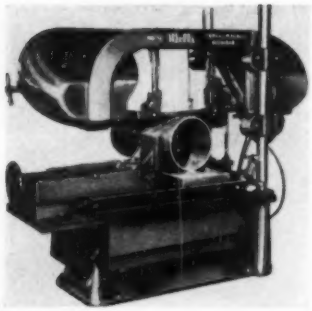
FLAME-CUTTING MACHINE—*Ohmstede Machine Works, Beaumont, Tex.* Model SC-42 flame-cutting machine comes equipped with a production-type base. The machine using magnetic tracing will cut an unlimited variety of shapes. The speed can be varied from 3 to 30 ipm. It will cut a 42-in. dia. circle and a straight line of 89 in.

WET-CUTTING SYSTEM—*Wells Mfg. Corp., Three Rivers, Mich.* Self-contained wet-cutting system is available for the Wells No. 5 Utility Model horizontal metal-cutting band saw. It is similar to those which have been used on the Wells Models No. 8 and 12.

BAR CUTTER—*Andrew C. Campbell Div., American Chain & Cable Co., Inc., Bridgeport 2, Conn.* Model 223 bar cutter is a hand-operated wet abrasive-cutting machine for fast cuts on practically all types of materials up to 2-in. dia. solid stock and 3½-in. dia. tubing.

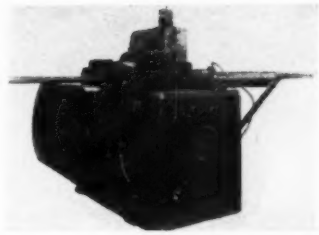
SAWING MACHINE — *Howell G. Macduff & Co., 91 Prescott St., Worcester 5, Mass.* Gravity-feed cemented-carbide sawing machine is driven from a line shaft or individual motor and will cut round, rectangular, square, or triangular pieces with a minimum amount of attention on the part of an operator.

ARBOR SAW—*Foster Mfg. Co., One Kinsey Ave., Buffalo, N.Y.* Tilting arbor saw listed as No. 95-C, is equipped with a self-indexing miter gage. A ¾-in. arbor will accommodate dado heads up to 1-1/16 in. Capacity of unit is 12x¾x34 in.

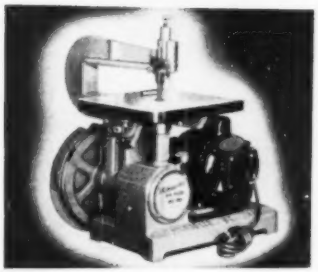


BAND SAW—*Wells Mfg. Corp., Three Rivers, Mich.* No. 12 heavy-duty metal cutting band saw with automatic cutting cycle and electrically controlled blade pressure, has a complete, self-contained wet-cutting system. Working capacity of the system is 3 gal. of ←fluid.

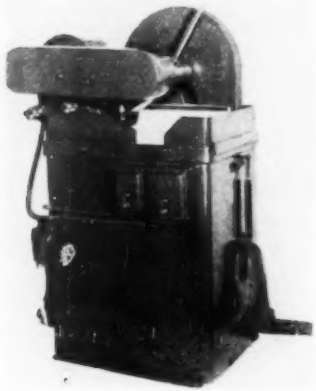
PIPE AND TUBE CUTTER—*Continental Machine Co., 1952 Maud Ave., Chicago 14, Ill.* Steen high-speed cutter is made in three sizes, Nos. 3, 6 and 12 for cutting pipe or tubes of diameters from ⅛ to 3, ⅛ to 6, and 3 to 12 in. respectively.



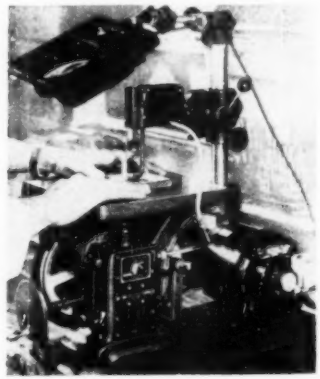
CUTOFF MACHINE—*Grieder Machine Tool & Die Co., 324 N. Maple St., Bowling Green, Ohio.* Cutoff machine cuts any diameter or wall thickness of tubing within range of machine in less than 1/3 sec. per cut. The cycle of the machine is 12,000 cuts per hr.



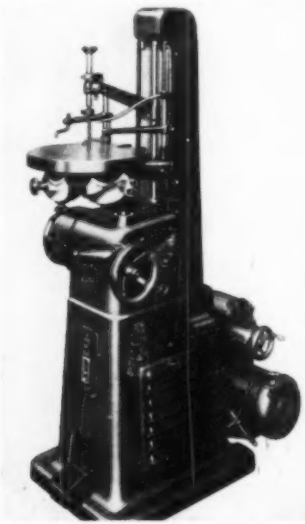
DIE FILER—*Rice Pump & Machine Co., Milwaukee, Wis.* Bench-type reciprocal filing machine, Model FS, Milwaukee die filer, performs all three die-making operations: filing, sawing and lapping, without changing overarms.



CUTOFF MACHINE—*DoAll Co., Des Plaines, Ill.* Two abrasive cutoff machines are: Model D-2, a dry-type machine using a 10-in. wheel mounted on a swinging arbor; and Model W, which is larger and includes a coolant tank and pump for wet cutting. It uses a 16-in. wheel. Capacity of Model W is 3-in. tubing, 2-in. solid bars. Model D-2 cuts solids to 1 in., tubing to 1½ in.

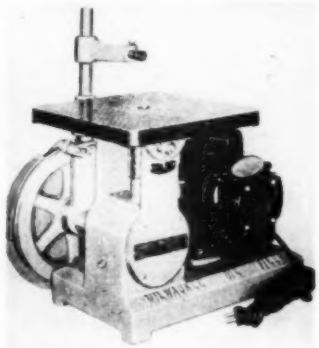


DIE FILER—*All American Tool & Mfg. Co., Chicago, Ill., and offered by The DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill.* Variable-speed precision die filer, All American Model 1500-S gives stepless speeds from 170 to 470 strokes per min. using DoAll Speedmaster, Model No. 3A. Machine can be used for filing, sawing, or honing, in a range of materials.



DIE-MAKING MACHINE—*Connecticut Tool and Engineering Co., 544 Iranistan Ave., Bridgeport 4, Conn.* Machine for filing of dies and machine parts is known as the Williams die-making machine. Table is in alignment with file holders at all times, and can be tilted in any direction. Machine will take files from 4 to 10 in. long, has an infinite speed range, and makes 75 to 300 strokes per min.

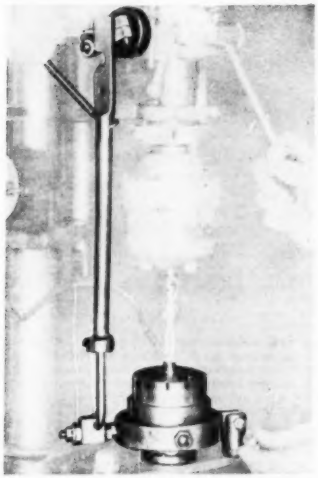
BAND-FILING MACHINE—*The DoAll Co., Des Plaines, Ill.* A 7-in. capacity DoAll band-filing machine can be operated by a person either seated or standing. The table height is 39 in. The worktable is 18 in. square.



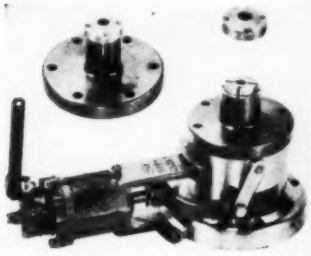
FILING MACHINE—*Milwaukee Chaplet & Mfg. Co., 1033 S. 40th St., Milwaukee 4, Wis.* Improvements in the bench-type, reciprocal filing machine are a serrated tilting worktable equipped with a 4-way tilting mechanism for tilting to 15° in any direction, and a universal-type chuck.

Tools and Accessories

AMERICAN MACHINIST 36th ANNUAL REVIEW



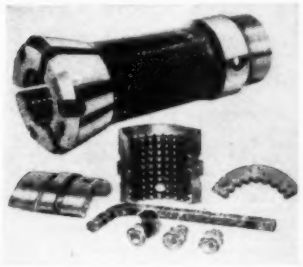
COLLET CHUCK—*Goodwin Mfg. Co., 10 East Broadway, Cuyahoga Falls 1, Ohio.* Collet chuck is said to speed drillpress production drilling and tapping operations. Mechanical linkage connects the quill to the chuck collar so that the chuck is automatically closed and locked as the tool approaches the workpiece.



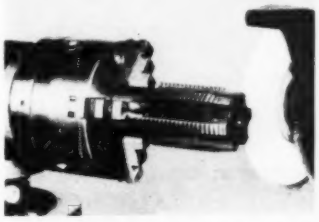
INTERNAL-EXPANDING COLLET—*Zagar Tool Co., Cleveland, O.* Internal-expanding collet is designed to be used on any standard collet attachments. The collet is a flanged device with a protruding section that extends beyond the flange and is split in four ways. It is made of spring-tempered tool steel.

COLLET CHUCK—*Erickson Tools Div., 2309 Hamilton Ave., Cleveland 14, Ohio.* Model 1200 precision collet chuck for rigidly holding larger-size workpieces, is designed to accommodate Erickson standard precision collets over a range of 8 to 10 in., in increments of 1/32 in.

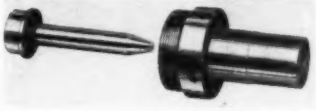
COLLET CHUCKS—*The Goodwin Mfg. Co., 10 East Broadway, Cuyahoga Falls, Ohio.* Quick-acting collet chuck can be used on South Bend, Logan, Atlas, and similar types of lathes. Chucks come in two sizes: a 1-in. capacity chuck fits lathes having 1⅛-in. 8-threaded nose spindle, and a 2-in. capacity model fits any lathe spindle to 3¾ in.



COLLET—*Sheffer Collet Co., Traverse City, Mich.* Pads can be changed without removing collet from the spindle on the style SM Master collet. Pads are held in place by means of a standard socket setscrew that locks a T-slot in the face of the collet.

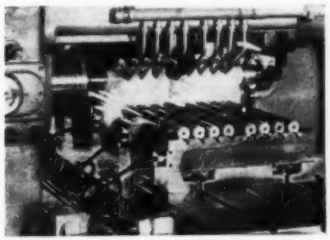


CHUCK—*D-S Grinder Div., Royal Oak Tool and Machine Co., Royal Oak, Mich.* Chuck for use with the D-S radial-relief grinder with a capacity of ⅛ to 5 in., is mounted on a faceplate equipped with ground arbor that fits the fixture spindle.

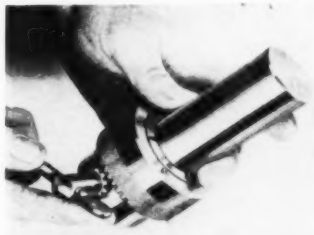


EXPANDING ARBOR—*Porst Bros. Mfg. Co., 259 N. California Ave., Chicago 12, Ill.* Expanding arbor for internal gripping is said to add to the utility of the 1-, 1½-, and 2-in. Levermatic collet chucks. Split arbor is mounted in chuck in place of the collet and collet nose and expanded by lever. Available from 5/16-in. dia. to 4⅝-in. dia.

COLLET CLOSER, STOCK FEED—*N. C. Nichols Machine and Engineering Co., 1 Sylvan St., Peabody, Mass.* Super Ball-Matic Hi-Speed collet closer and stock-feeding attachment is said to convert lathes and hand-screw machines into semi-automatics. Attachments allow feeding of stock automatically in lengths to 0.10 in.

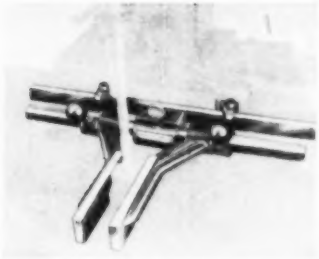


CHUCKS—*Rockford Magnetic Products Co., Inc., 1302 Eighteenth Ave., Rockford, Ill.* Power-grip Viking chucks have a double magnetic circuit, with magnetic poles running the full length of the chuck. Unit accomplishes a magnetic penetration that makes possible use of interchangeable fixtures for production milling, grinding, and similar operations.



COLLET CHUCK—*Alex Ronald, 333 East 53rd St., New York 22, N. Y.* Martin 2-in. collet chuck provides a viselike grip with a twist of the chuck sleeve. Seven sizes of round stock can be accommodated with the three collets which are slotted at both ends. Chucks are available to fit either 1- or 1½-in. 8-thread spindles.

SPIRAL-GRIP COLLET—*Shell Machine Co., 21306 John R St., Hazel Park, Mich.* Spiral-grip non-slip collets have serration pattern said to present a 100% contact with the thrust surface of stock. Serrations are staggered and do not track.



WORKHOLDER—*Universal Vise & Tool Co., Parma, Mich.* Safety workholder which fits box-column single-spindle drillpresses is listed as Model 8. The tool locks to the column dovetail and is adjustable to fit all presses of this type. Jaws open to accommodate 11-in. work.

VISES — *Hartmann Mfg. Co., 1600 Junction Ave., Racine, Wis.* Jawset production vise, No. 410, has a 4-in. jaw and an opening of 5⅛ in. The No. 610 vise has a 6-in. jaw and an opening of 7 in.

VISES — *Hartmann Mfg. Co., 1600* Model DVH-150 air-hydraulic vise uses flexible, controlled air pressure as a clamping force. The vise develops a clamping pressure of 150 times the operating air-line pressure from any air-line pressure up to a maximum of 125 lb.

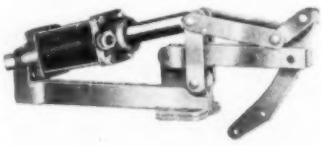
VISE—*Ervood Co., Crystal Lake, Ill.* Swivel-base milling-machine and drill-press vise, has base and frame cast from semi-steel. Jaw width is 4 in. with an opening 2½ in. and a depth of 1 in. Base is calibrated in 180° of rotation.

VISE—*The Producto Machine Co., Bridgeport, Conn.* Self-centering vise which can be mounted for both vertical and horizontal use, holds shafts or spindles ⅜ to 3⅛ in. in diameter in 4¼-in. jaws for machining keyways, slots or splines.

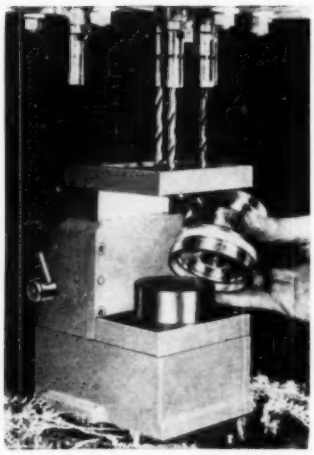
TABLE — *Porter-Cable Machine Co., Syracuse, N. Y.* Improved automatic feed table for the BG-8 wet-abrasive belt grinder improves accuracy and smoothness of feeding work into belt. Two separate fluid systems have been installed—one for coolants, and one for hydraulic oil.

BENCH VISE—*Hartmann Mfg. Co., 1600 Junction Ave., Racine, Wis.* Bench vise listed as No. 450, works by straight lever action. A swivel base enables full 360° travel. The jaw size is 4½ in., while the maximum opening is 6 in.

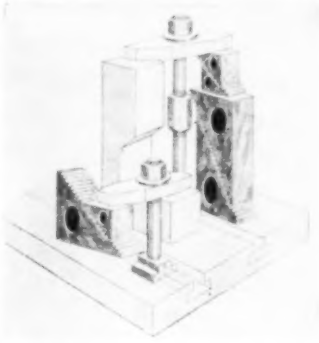
VISES—*North Bros. Mfg. Co., Philadelphia, Pa.* Angle vises, with or without swivel bases can be used on the bench or on the machine. They are ground on both sides, front end and bottom for use on drillpresses, milling machines, and similar machinery. A 90° scale is stamped on the vise for setting at proper angle for work.



AIR-OPERATED CLAMP — *Lapeer Mfg. Co., Lapeer, Mich.* Toggle-action air-operated clamp is designed for holding around - the - corner work. Listed as the Model DTAO-400, the clamp produces a plier-like grip. Clamping pressure of the toggle jaw is approximately 300 lb. at the inner hole. Operating air-pressure is 85 lb.



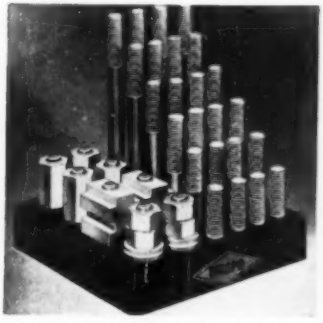
JIG-VISE—*Deublin Co., Northbrook, Ill.* Pneumatic double-action jig-vise for clamping repetitive work to be drilled, filed, ground, polished, or assembled, has operating parts enclosed. A grease-pocket system maintains lubrication of moving parts. Clamping pressure can be adjusted from 0 to 10 times line pressure.



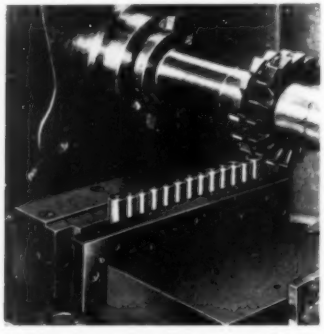
STUD SET—*Northwestern Tool and Engineering Co., 117 Hollier Ave., Dayton 3, Ohio.* Setup stud sets with a selection of T-nuts for table slotted machines ranging from 7/16 to ⅞ in., consists of six T-nuts, four coupling nuts, and four studs of each length from 3 to 8 in. Lengths up to 15 in. can be attained.

VISE—*Nutmeg Tool & Products, Norwich, Conn.* Double-cam-actuated vise for milling, drilling and threading operations locks the work with one motion of the handle, automatically centers the work regardless of dimensional variation and releases the work and removes the chips with return motion of the handle. Model is made in two sizes.

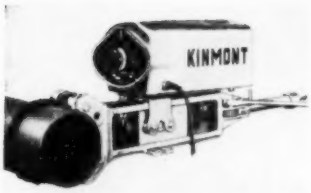
VISE—*Van Products Co., 1521 G. Daniel Baldwin Bldg., Erie, Pa.* Heavy-duty air-operated foot-controlled vise, model 610 Vi-Speed, has larger jaws and wider maximum openings than standard model, permitting the positive holding of larger castings, forgings, and other pieces.



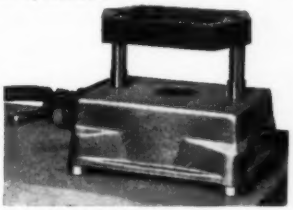
STUD AND NUT SET—*West Point Mfg. Co., 19637 Merriman Court, Farmington, Mich.* Stud and nut sets are available in ¾-, ⅝-, and ½-in. standard thread sizes in class 3 fit. Each set includes four each of 3-, 4-, 5-, 6-, 7-, and 8-in. studs, four each of the nuts, washers, T-slot nuts and coupling nuts.



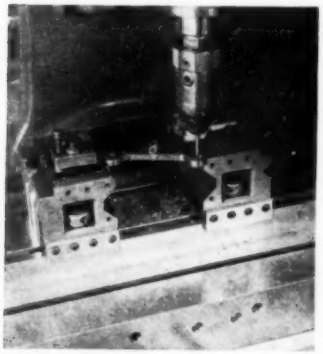
GANG VISE—*Dery Tool and Die Co., Pine Meadow, Conn.* Equalizing gang vise consists of a solid jaw and a body for holding a series of equalizing pads or blades. Pieces with a diameter variance can be milled simultaneously since blades will equalize, allowing piece to be held firmly.



POWER TOOL—*Kinmont Mfg. Co., Inc., 718 W. Wilson Ave., Glendale 3, Calif.* Universal power tool is designed for the turning of any round, nearly round, or hexagonal object, requiring up to 400-lb. circumferential turning force at a surface speed of 3 to 26 ipm. It can be used as a positioner for welding, cutting, fitting, grinding and similar operations.



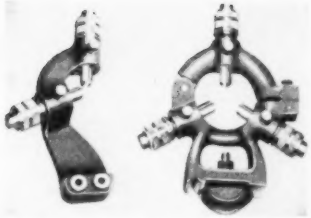
JIG BASE—*The Industrial Clutch Corp., Waukesha, Wis.* Air-clamp jig base is a pneumatic work-holding fixture for jig drilling. Variations in thickness of the pieces to be drilled are automatically compensated for by air pressure. Jig base operates on 50-lb. min. air pressure. Four sizes are available.



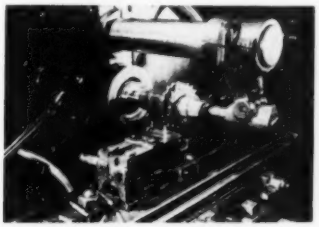
HOLDING FIXTURE—*Hanson and Co., Detroit 11, Mich.* Holding fixture for use on jig-boring and jig-grinding machines have standard 16-in. base. An indicator checks accuracy to 0.0002 in. starting from any point of the base.

DRILLPRESS-VISE—*Chicago Tool & Engineering Co., 8383 S. Chicago Ave., Chicago 17, Ill.* A 3-in. jaw drillpress vise is offered as part of the Palmgren line of machine vises. The No. 320 vise has jaws 3 in. wide, which open 3 in.

PNEUMATIC VISE—*Production Devices, Inc., Whitehall, N. Y.* The Airlox Senior Model S-200 pneumatic vise is designed primarily to do production workholding on the 40- to 50-hp. milling machines. A gripping power ratio of 200 to 1 is offered.

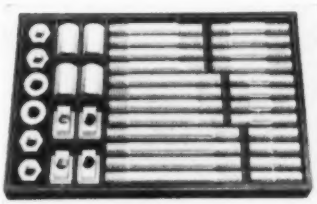


WORK SUPPORTS — *South Bend Lathe Works, 378 East Madison St., South Bend 22, Ind.* De Luxe-type follower rest and center rest feature wrenchless adjustment and locking of jaws. Each jaw has a large knurled knob for adjusting the jaw position, and a thumbscrew for locking.

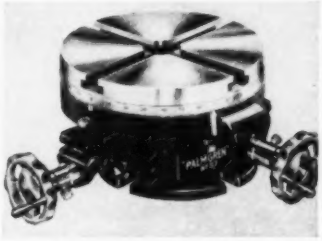


SELF-CENTERING DEVICE—*Mueller Industries, Dept. 8, 4755 N. Rockwell St., Chicago 25, Ill.* Self-centering device is featured on the universal part holder for use on milling, drilling, assembling, threading, and similar operations. The clamp jaws have a 3/16-in. maximum opening. It will take work to 1 in., round or hex, or odd-shaped pieces within that range.

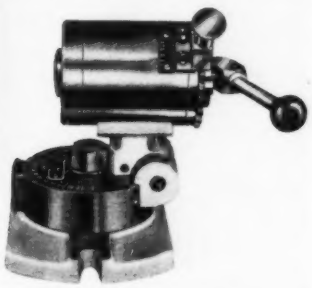
TOGGLE CLAMP—*General Welding Co., 7404 Euclid Ave., Cleveland 3, Ohio.* All-welded heavy-duty toggle clamp designed to withstand severe service has all pivot pins welded to the frame and linkage.



STUD AND NUT SET — *Noble & Stanton, Inc., Bedford, Ohio.* 40-piece setup stud and nut set is chrome plated. By using coupling nuts, any desired length from 3 to 16 in. in 1-in. multiples can be obtained.

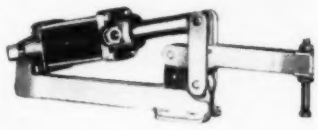


INDEXING TABLE—*Chicago Tool and Engineering Co., 8383 S. Chicago Ave., Chicago 17, Ill.* Indexing and cross-slide table with a graduated rotary top listed as the Palmgren No. 82, is graduated for the full 360° and can be rotated manually or locked. Table is 8 in. in dia.



DIVIDING-COLLET HEAD — *Matco Tool Co., 2834 W. Lake St., Chicago 12, Ill.* Improved universal dividing-collet features tailstock attachment for added advantages in centering work. A lever-action collet closer is featured. Collet head takes to 1-in. capacity 5C ground thread collets.

LAYOUT TABLE—*The Erwood Co., 214 Woodstock St., Crystal Lake, Ill.* Rotary layout table, calibrated in 360° of rotation, is designed for accurate layout work in toolrooms. Index on the adjusting spindle permits settings to within 6 in.



CLAMP — *Lapeer Mfg. Co., Lapeer, Mich.* Air-operated clamp, listed as AO-400 has a maximum clamping pressure of 400 lb. The air-operated double-acting clamp will not release clamped work in case air pressure fails.

TOOLHOLDER—*Burg Tool Manufacturing Co., Dept. AM, 5028 W. Jefferson Blvd., Los Angeles 16, Calif.* Tool-Flex Neoprene-mounted, non-releasing, pull-out type, flexible tool-holder for use when tapping on screw machines is said to prevent binding, absorb shock, keep taps on center and permit them to follow original hole.

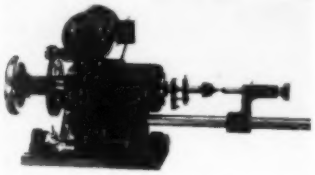
TAPER DRIVE—*Eclipse Counterbore Co., 1600 Bonner Ave., Detroit 20, Mich.* Detachable taper drive for tungsten-carbide and high-speed steel end-cutting tools for single-purpose mass-production operations is said to eliminate necessity of "drifting out" cutter from holder.

SLIDE FEED—*The U. S. Tool Co. Inc., Ampere, East Orange, N. J.* Air-operated slide feed, a self-contained unit takes no connections from the press. It can be used on all types of fabricating machines and can be moved from one machine to another.

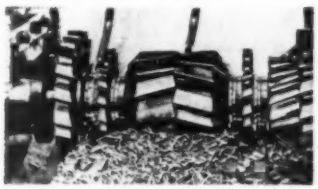
LATHE TOOLHOLDER—*McKenzie Engineering Co., Newtown, Conn.* McKenzie all-purpose lathe toolholder takes the place of four separate toolholders for boring, threading, cutting off and turning, and uses the full length of the toolbit.

MANDREL—*Erickson Tools Div., 2309 Hamilton Ave., Cleveland 14, Ohio.* Double-sleeve air-operated mandrel Model 601-AT-5A1, combines the Erickson precision mandrel and air cylinder. Air-chuck principle is utilized to actuate special drawbar mandrel.

HOLDER — *Eclipse Counterbore Co., Detroit, Mich.* Short series holder for use with standard core-drill cutters is offered in four sizes. The smallest holder is 1¼ in. in diameter and takes Eclipse standard core-drill cutters from 1½ to 1 13/16 in. dia. The largest holder, 2 in. in diameter, takes cutters from 2 5/8 to 3 in. inclusive.

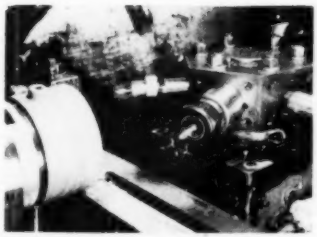


RADIAL RELIEF FIXTURE—*Glenbard Tool Mfrs. Inc., 216 N. Clinton St., Chicago, Ill.* A radial-relief fixture for producing cutting tools needs no special cams to regulate spiral or radial relief. Indexing of flutes desired, from one to six, is controlled by a quick gear change. Work up to 1-in. dia. can be accommodated in a draw-bar collet.



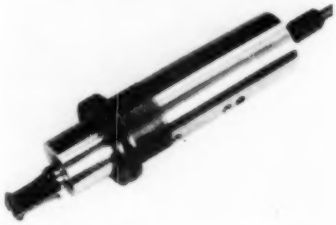
MILLING SPACERS—*George Scherr Co., Inc., 200 Lafayette St., New York 12, N. Y.* Euco Micrometric expanding milling spacers for gang and straddle milling are hardened and ground throughout, and are heat-treated to a Brinell of 590. Milling cutters in any desired combination can be assembled to an accuracy of 0.0005 in.

EJECTOR-TYPE HOLDER — *Resistance Welding Dept., Ampco Metal Inc., Milwaukee 46, Wis.* Water-cooled ejector-type holder for spot-welder tips has a leakproof replaceable seal of Sirvene rubber. The head is an aluminum-bronze alloy.



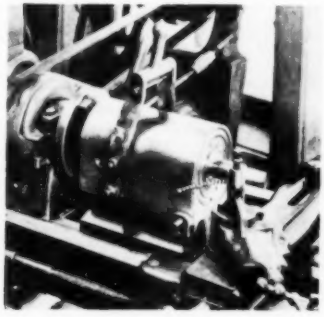
HOLDER—*Erickson Tools Div., 2309 Hamilton Ave., Cleveland 14, Ohio.* Full-floating holder is offered for holding taps and reamers during precision operations. Standard Erickson No. 400 Series Collets are used with a range of 1 to ⅛ in. in increments of 1/32 in.

TOOL RACK—*Davis Development Co., 3½8-7½ First National Bank Bldg., Colorado Springs, Colo.* Slotted hardwood blocks slide into shaped aluminum backstrip. Called the Wizard Toolrak, blocks are variously drilled, counterbored and slotted to hold commonly used hand tools.

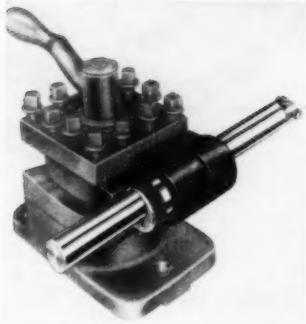


TOOLHOLDERS—*The Maxwell Co., Bedford, Ohio.* Automatic recessing toolholders have been developed for use with machines having automatic feeds. Tools are operated by a drawbar having a telescopic adjustment for tool location. Circular form cutters, either high-speed steel or carbide tipped, can be used.

MOTOR-MOUNTED COLLET CHUCK—*Goodwin Mfg. Co., Cuyahoga Falls 1, Ohio.* Motor-mounted collet chuck serves as a low-cost lathe. The lathe is used for secondary operations such as deburring, filing, and polishing. A spring ejector can be provided to speed production work.



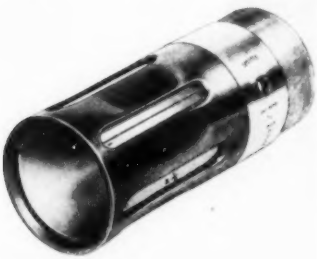
COLLET SPEED CHUCK — *Zagar Tool, Inc., 23850 Lakeland Blvd., Cleveland 17, Ohio.* Model B collet speed chuck rotates on its own bearings and derives its turning power from the spindle of the machine.



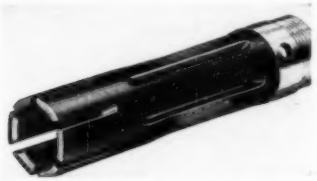
BORING-BAR HOLDER—*Rex Mfg. Co., 857 St. James Ave., Springfield 4, Mass.* Boring-bar holders for use on the square toolpost on turret lathes has split adapters allowing eight different sizes of bars to be used. A grip of 4 in. reduces chatter and vibration.

FEED FINGER PADS—*Kennametal Inc., Latrobe, Pa.* Line of cemented-carbide feed finger pads are for use in master feed fingers of Brown & Sharpe, Hardinge, and Davenport automatic screw machines. Pads are offered in internal diameters ranging from 9/32 to 1 1/16 in.

WIRE CONTROL, STRAIGHTENER UNIT—*Metallizing Engineering Co., Inc., 38-14 30th St., Long Island City 1, N. Y.* Wire control and straightening unit, Metco Type 2W, has an outer metal hoop which keeps the coil on the reel. The machine handles 3/16-in. wire.

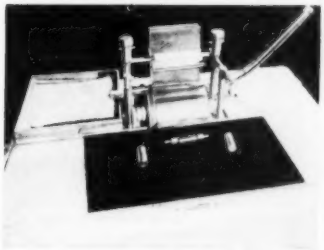


PUSHER—*Sheffer Collet Co., Traverse City, Mich.* Padded pusher with a long bearing surface, called the Better Bearing Master Pusher, has external threads ground from the solid to assure concentricity.

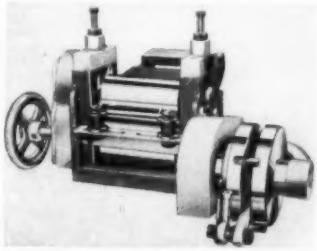


STOCK PUSHER—*Sheffer Collet Co., Traverse City, Mich.* Stock pusher, adjustable to the squirrel-cage type, will feed to the very end of stock. Called the Economy stock pusher, it has a dual bearing, one in the mid-section and one in the nose.

POWER PRESS UNIT—*Carl G. Peterson Co., East Providence, R. I. and distributed by Earl Elwyn Smith & Associates, Dept. AM, West Hartford 7, Conn.* Select-O-Matic multi-pawl universal power-press feed unit is an adjustable universal ratchet-feed unit, designed to provide intermittent and unvarying movement of coil-stock materials through metal-stamping machines and punch presses.



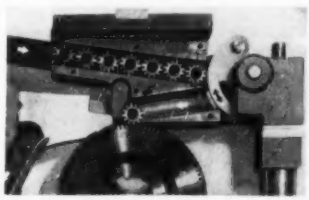
FEED ADJUSTMENT—*Size Control Co., Div. American Gage & Machine Co., 2500 Washington Blvd., Chicago, Ill.* Automatic feed attachment is used with their centerless lapping machine. Feeding, holding and ejecting are automatic. Cylindrical pieces feed in between lapping rolls and are lapped to a finish of less than 2 micro in.



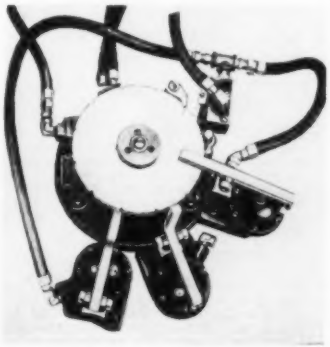
ROLL FEED—*Roll-Feeds Corp., 148 Middle St., Pawtucket, R.I.* Friction roll feed, suitable for 4-, 6-, 8-, and 10-ton bench, and pedestal-type high-speed power presses has four points of contact to safeguard accuracy and can be used for side or rear feeding.

REELS—*LaBahn Machine & Mfg. Co., Menlo Park, N. J.* Stock reels and scrap winders are offered in more than 25 models. Reels come in spoke or disk type, plain, automatic brake or motorized spindles. Capacities range from 150 to 1000 lb.

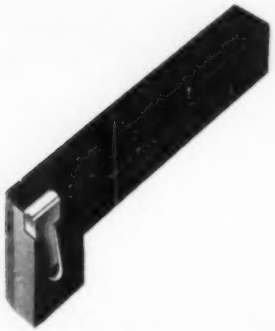
BAR-STOCK FEEDER—*Production Tool & Die Co., Inc., 572 St. James Ave., Springfield, Mass.* Bar-stock feeder called the Pond Production Operator, No. 200, performs four hand operations automatically; opening vise, ejecting finished piece, locating bar for next cut, and starting machine cycle. Feeder handles round, rectangular or extruded shapes.



AUTOMATIC LOADING DEVICES—*Michigan Tool Co., 7171 E. McNichols Road, Detroit, Mich.* Line of automatic loading devices for gear-finishing machines to suit varied production requirements automatically reduces idle time per machine to 2 sec. per gear or less. They are designed for use on both rack- and rotary-type gear-finishing machines.



DIAL FEED TABLES—*The A. K. Allen Co., 3011 Ft. Hamilton Parkway, Brooklyn 18, N.Y.* Models 11A and 11B dial feed tables have 11-in. dia. index plate and 14-in.-dia. base. Table operates by means of compressed air through a 3-way valve.



EJECTOR TOOL—*Super Tool Co., 21650 Hoover Rd., Detroit 1., Mich.* Rectangular ejector tool is the vertical type with a rectangular-carbide insert. Two types are offered. One with a straight holder for shoulder cuts, presents the carbide insert with a 15° lead angle, or at right angles to work. The other is an offset holder for heavy roughing cuts.

TOOL—*Super Tool Co., 21650 Hoover Rd., Detroit 13, Mich.* Special-purpose ejector-type tool cuts the belt track on the periphery of a pulley and faces the edges at the same time.

CARBIDE INSERT—*Super Tool Co., 21650 Hoover Rd., Detroit, Mich.* Standard carbide inserts 1½ in. long are offered for their vertical ejector-type tools. The longer-length bit offers approximately 12 additional grinds under normal conditions.

CIRCULAR TOOL—*R. F. Cook Mfg. Co., 2732 Second St., Cuyahoga Falls 3, Ohio.* Carbide-tipped tool is capable of performing turning and single-chamfering operations. The tool incorporates four individual cutting edges, and can be used on any type of automatic.

CUTTING TOOLS—*R. F. Cook Mfg. Co., Cuyahoga Falls, Ohio.* Multi-operation carbide-tipped cutting tool can chamfer a small bore, ream a step, ream a diameter, chamfer a diameter, ream a counterbore diameter and chamfer a counterbore diameter, all simultaneously with one tool.

TOOL—*Triangle Equipment Co., Inc., 45 River Road, Nutley, N. J.* Sample-Marshall Diamond-bonded tools have each diamond particle set individually on the working surface and imbedded to support the adjoining particles.

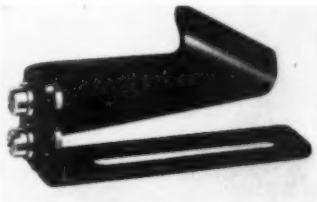
SMALL TOOLS—*Kennametal Inc., Latrobe, Pa.* Small tools have mechanically held tips. Tools have shanks ½, ⅝, ¾, and 1 in. square. Listed as Kendex tools the tips are made in four different shapes: square, round, triangular, and pentagonal.

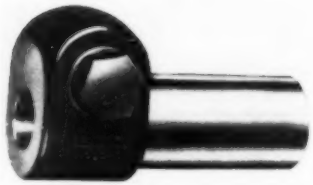
TOOLS—*Kennametal, Inc., Latrobe, Pa.* Part of the line of Kennamatic tools, they have indexable and replaceable solid Kennametal inserts, square or triangular, mechanically held in a vertical position. Tools, available with various grades of cemented-carbide inserts come in sizes from ¾ in. square to 1x1½ in.

TOOLS—*Kennametal, Inc., Latrobe, Pa.* Kennamatic heavy-duty tools offer four styles, two having square inserts and two having cylindrical inserts of solid Kennametal cemented carbide.

RECESSING TOOLS — *The Maxwell Co., 386 Broadway, Bedford, Ohio.* Jig-and-fixture type recessing tools for precision recessing where tool must work through jigs and fixtures, is offered in three sizes to machine diameters ranging from ½ to 2 3/16 in.

TOOLBITS—*Redhard Metals, Inc., North York Rd., Hatboro, Pa.* Redhard precision kit containing twelve toolbits in three grades of cutting metal is made of special Plexiglas. Sizes of toolbits are from 3/16-in. square to ⅜-in. square for each grade.





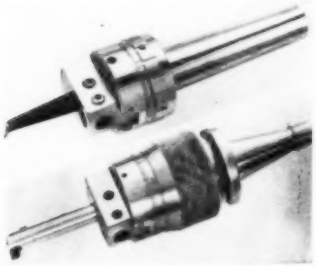
SCREW-MACHINE TOOLS—*Brown & Sharpe Mfg. Co., Providence 1, R. I.* The closer for opening die holders, Model No. 200, upper illustration, can be used on all three sizes of No. 00, 0, and 2 automatic screw machines for closing self-opening die heads. The No. 22-00 adapter, lower illustration, permits the use of No. 00 size tools on No. 2 machines, and the No. 22-20 adapter permits the use of No. 0 size tools on No. 2 machines.

SOLID-CARBIDE TOOLS—*The Viking Tool Co., Shelton, Conn.* Turning and facing tools, embody a mechanical locking device for inserted solid-carbide toolbits. Tools are stocked in standard shank sizes from ⅝- to 2-in. tool heights in straight, 15° nose angle, offset and offset facing.

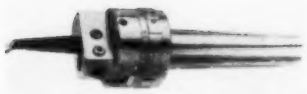
FORM-TOOL BLANKS—*The Production Service Co., 1069 Broad St., Newark 2, N. J.* Line of high-speed form-tool blanks for use in making finished form tools for automatic-screw machines using circular cutters, made from a standard brand 18-4-1 high-speed steel can be furnished soft or in a hardened condition having a 64-65 Rockwell C hardness.

BORING TOOL—*Tree Tool and Die Works, Racine, Wis.* Taper-boring tool fits all milling machines, jig borers, and boring bars, and is 4 in. in dia. and 5 in. in length.

BORING, REAMING TOOL—*Erickson Tool Division, Erickson Steel Co., 2309 Hamilton Ave., Cleveland 14, Ohio.* Erickson-State boring and reaming tool formerly the State boring and reaming tool has a four-cutter principle for jobs from 1/16 to 5½ in.



BORING, FACING TOOLS—*The Maxwell Co., 286 Broadway, Bedford, Ohio.* Series No. 30 boring head has a high capacity made possible by the 3-position location features in each head for the boring bar. Maximum boring-bar capacities of tools cover a boring range of from ¾ to 20 in. Series No. 40 power-facing tool has the same boring capacities as Series 30 plus a power-facing feature.



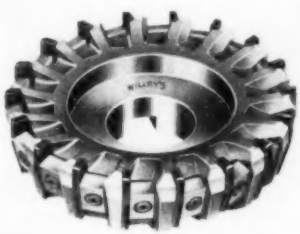
BORING TOOLS—*Maxwell Co., 300 Broadway, Bedford, Ohio.* The gib is eliminated in locking the tool-block dovetail. All wear surfaces feature hard chroming. The E-Z set boring tools are available in three models with maximum boring-bar capacities of ½, 1 and 1½ in.

BORING TOOLS—*Criterion Machine Works, Beverly Hills, Calif.* National distribution of the Criterion line of boring tools will now be handled by the Wendt-Sonis Co., Hannibal, Missouri. Criterion boring heads and bars are available in toolroom sets consisting of single head and bar sets or combination of large and small heads.

CUTTERS, MILLS — *Kendall Corp., 2357 N. 29th St., Milwaukee 10, Wis.* Series of fly cutters and face mills made to fit conventional arbors and standard American spindle nose drives of milling machines, embodies hexagon-shaped toolbit holders to permit angular setting of toolbit and positive locking means to maintain this setting. Three sizes, 6, 8, and 10 in. are available.

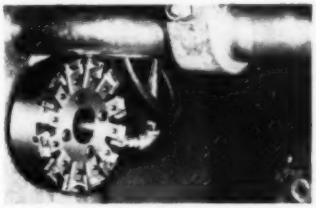
END MILL—*Cadillac Cutter Co., 1613 Eastern Ave., S.E., Grand Rapids 7, Mich.* Line of regular double-end mills with three cutting edges is said to hog metal as fast as the 3 flute, and leave finish of the 4 flute.

END MILLS—*Weddell Tools, Inc., Rochester 11, N. Y.* Solid-carbide ⅜-in Tri-Bit, has now been applied to small solid-shank end mills and shell-type face mills, 1½-, and 2-in. dia. and up, respectively; and to small slotting cutters ¼ in. and up in width, as well as to special tools.



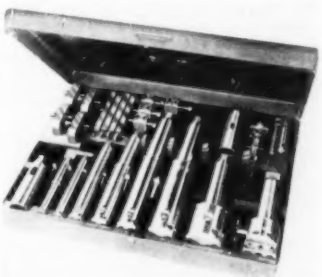
FACE MILL—*Willey's Carbide Tool Co., Detroit, Mich.* Axial face mill for cast iron designed to handle straight facing and heavy roughing cuts, can also be used for finish milling. In many cases the operations can be combined. Face mills are offered in six sizes, cutter diameters ranging from 4¼ to 14 in., having from 8 to 28 blades.

CUTTERS—*Nelco Tool Co., Inc., Manchester, Conn.* Face-milling cutters are made in sizes from 6 to 14 in. in. diameter. The first has a fine-pitch face mill for use primarily on cast iron, brass and bronze. Interchangeable blades are available for use on any material.



MILLING CUTTER — *Diamond-Detroit, Inc., Detroit 2, Mich.* Milling cutter used for face milling, embodies solid triangular-carbide inserts which can be adjusted or substituted in the cutter head while the latter is in milling position. When blade becomes dull, it is turned to the next triangular cutting edge.

FACE-MILLING CUTTER—*Kutscha Cutter Co., 621 West 75th St., Chicago 21, Ill.* Type B face-milling cutter has inserted blades for carbide-tipped bits. Cutters are built for circular milling, or by adjustment for step milling, radial as well as axial. Cutters are available in sizes from 6 to 14 in. in diameter.



TOOL SET—*Davis Boring Tool Div., Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.* Combination tool set including various sizes of micrometer fly-cutter tools, an offset boring and facing head, jacks, parallels and adaptors includes seven different sized boring tools having an infinite cutting range in diameters from 1¼ to 7 in.

CUTTER—*Aber Engineering Works, Inc., Waterford, Wis.* Carbide-tipped curved-tooth milling cutter is provided with special locking screw for locking carbide blade rigidly to cutter body. Curved tooth shearing action counteracts inherent brittleness of carbide. Cutters over 1 in. wide have inserted carbide blades; under 1 in., brazed-in blades.

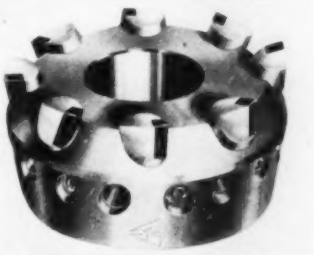
CARBIDE END MILLS—*The W. T. Howald Machine Works, 182 Sigourney St., Brooklyn 31, N. Y.* Carbide end mills have replaceable blades in 1½-in., 2-in., and 3-in. dia. sizes. Mills have No. 40 NMTB, Weldon, or B&S No. 9 taper shanks.

END MILLS—*Morse Twist Drill & Machine Co., New Bedford, Mass.* Hi-Helix end mills are designed for rapid removal of chips from cutting area. Hook in the cutting face curls the chips. Formed back of teeth add extra strength, minimizing breakage.

END MILLS—*Brown & Sharpe Mfg. Co., Providence 1, R. I.* Eight fast-spiral end mills include: long, single-end end mills from ¼- to 2-in. dia.; extra long, single-end end mills from ¼- to 1¼-in. dia.; double-end end mills from 3/32- to 4/16-in. dia.; long double-end end mills from 3/32- to 3/16-in. dia.; long two-flute single-end end mills from ⅛- to 1-in. dia.; two flute double-end end mills from 1/16- to 3/16-in. dia.; and ball-end, two-flute single-end end mills from ⅛-to 1-in. dia.

FACE MILL—*The Gairing Tool Co., 21221 Hoover Rd., Detroit 32, Mich.* Carbide face mill in standard sizes of 5-in. dia. and over, known as the E-Con-O-Mill, has same blades and locks fitting all sizes of cutter bodies. Blades are made in three types with varied radial rakes for steel, cast iron, and non-ferrous materials.

E-CON-O-MILL—*The Gairing Tool Co., Detroit, Mich.* Heavy-duty model of the E-Con-O-Mill line of standard face mills is designed for roughing operations where the greatest wear occurs along the periphery of the tool. Blades are set at an angle to allow greatest adjustment in a radial direction.

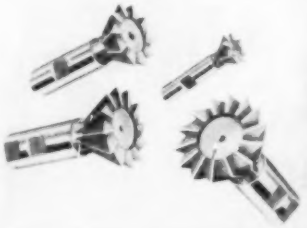


MILLING CUTTER—*Wendt-Sonis Co., Hannibal, Mo.* Milling cutter featuring an inserted-tooth design, is equipped with right-hand cutting blades as standard and can be used as a left-hand cutter by inserting a set of left-hand style blades.

CUTTER BLADE—*Weddell Tools, Inc., Rochester 11, N. Y.* Light-duty cutter blade has been added to their line of triangular-shaped cutter blades. Known as the ⅜-in. Tri-Bit, it is furnished in solid carbide only.

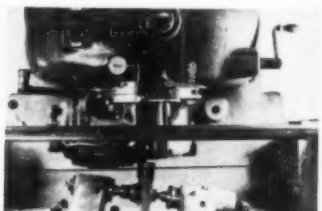
MICRO-MILLS—*Severance Tool Industries Inc., 726 Iowa St., Saginaw, Mich.* Micro-Mills are designed for speedy internal finishing, in sizes of $\frac{1}{8}$ in. and larger having tapered shanks. Standard internal grinding spindles or quills can be adapted for mounting. Nine standard sizes range from $\frac{3}{8}$- to $1\frac{1}{2}$-in. dia.

MIDGET MILLS—*Severance Tool Industries Inc., Saginaw, Mich.* Three large-size carbide midget mills, operate at speeds of 2000 to 5000 sfm. The cutting action and controllability of the mill is greatly increased, being aided by the gyroscopic balance characteristic of the higher-speed power tools—either air or electric.



ANGULAR CUTTERS—*Weldon Tool Co., 3000 Woodhill Road, Cleveland 4, Ohio.* Shank-type angular cutters are used in welding end-mill holders. Cutters can be used for cutting dovetails and similar work. Cutters can be used in collets as well as in the welder holder.

MICRO-MILLS—*Severance Tool Industries Inc., 726 Iowa St., Saginaw, Mich.* Improved micro-mills are now made with their forward end relieved, thus making it possible to finish the bottom of blind holes or face shoulders and ends of parts.



INVOLUTE CUTTER — *National Broach and Machine Co., 5600 St. Jean, Detroit 13, Mich.* Conical involute cutter for close-shoulder gear shaving, is designed to overcome the difficulty of restricted cutting action because of the small angle between the axes of the cutter and work gear.

DRILLS—*Chicago Latrobe Twist Drill Works, 411 West Ontario St., Chicago 10, Ill.* Harduty carbide-tipped drills, Type No. 1750, for use in hardened die steel or similar case-treated steels, enables parts to be drilled after they have been hardened without the usual annealing process or grinding method. Drills come in diameters from 3/32 to $\frac{3}{4}$ in. in 1/32-in. increments.

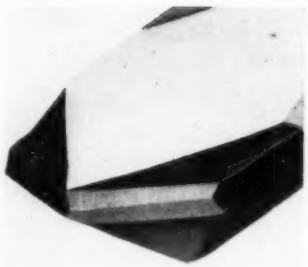
COUNTERSINKS—*The Aero Tool Co., 6930 Avalon Blvd., Los Angeles 3, Calif.* Spiral-flute countersink is designed to reduce chatter. The high-speed steel spiral-fluted countersinks offer three spiral flutes. Cutters are available in $\frac{5}{16}$-, $\frac{1}{2}$-, and $\frac{5}{8}$-in. dia., with $\frac{1}{4}$-in. shanks and $\frac{3}{4}$- to 1-in. dia. with a $\frac{1}{2}$-in. shank.

DRILLS—*Chicago Latrobe Twist Drill Works, 411 West Ontario St., Chicago 10, Ill.* Spiral-flute carbide-tipped masonry drills are available in all sizes from 2/16 to $1\frac{1}{2}$-in. dia., as well as in sets packaged in a toolkit roll with plastic pockets.

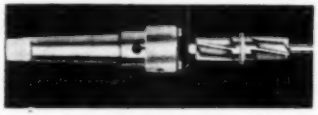
DRILLING, REAMING TOOL—*Severance Tool Industries, Inc., 726 Iowa St., Saginaw, Mich.* High-speed drill-reamers are offered in five sizes: 3/16-, $\frac{1}{4}$-, $\frac{3}{8}$-, $\frac{1}{2}$-, and 9/16-in. diameters. Tools are said to accomplish both drilling and reaming in one continuous stroke.

CARBIDE DRILL—*National Tool Salvage Co., 6511 Epworth Blvd., Detroit, Mich.* Carbide drill for drilling hardened high-speed steel incorporates a special grind said to result in faster cutting with less heat.

MICRODRILL — *Teletronics Laboratory, 352 Maple Ave., Westbury, N. Y.* Precision instrument for rapid drilling of accurate small holes is called Microdrill. Standard model has a collet for 0.004- to 0.025-in. pivot drills and a maximum recommended electronic-feed travel of 0.150 in. The maximum spindle speed is approximately 50,000 rpm.

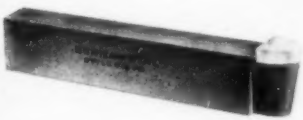


CARBIDE TIPS—*Super Tool Co., 21650 Hoover Rd., Detroit, Mich.* A line of standard carbide-tipped drills are designed for drilling holes in dies, fixtures and similar work after the metal has been hardened.



COUNTERBORE—*Plan-O-Mill Corp., 1511 East Eight Mile Road, Hazel Park 20, Mich.* Counterbore, with cutting edges at two ends, called the Plan-co double-end counterbore, is available in a complete range of sizes in high-speed steel or with tungsten-carbide inserts.

TAPERED SHANKS—*Super Tool Co., 21650 Hoover Rd., Detroit 13, Mich.* Tapered shanks have been added to their standard line of carbide-tipped twist drills. Tapered shanks are available in the same sizes as straight shanks, from $\frac{1}{8}$ to 1 in.



PLANER TOOLS—*Kennametal, Inc., Latrobe, Pa.* Square-nose and round-nose type are for planing cast-iron on modern types of planers having a clapper-box lift. Two styles are available.

PLANER TOOLS—*Kennametal Inc., Latrobe, Pa.* Clamped-on planer tools for machining cast iron are capable of removing 3 to 4 cu. ft. of cast-iron between regrinds, when used in any of the newer types of planers having a clapper box lift. Six different styles are available in various shank sizes.

REAMERS—*Super Tool Co., 21650 Hoover Rd., Detroit, Mich.* Carbide-tipped reamers, known as the Ream-Rite line are not designed to line-reaming setups, but are suggested for automatic and hand screw machines and work not requiring a long flute to operate through bushings.

REAMER—*U.S. Carbide Tool Co. Inc., 3266 E. 49th St., Cleveland 4, Ohio.* Special form reamer takes five cuts in one pass—end, taper, face, chamfer and outside diameter. Inserts of super-hard, super-tough tungsten carbide are electronically brazed into face of the points.

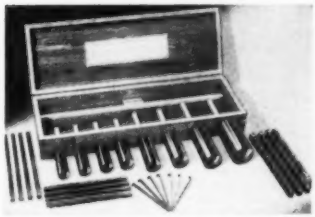
REAMER—*U.S. Reamer & Tool Corp., 12½ S. Isabel, Glendale 5, Calif.* Single-blade expansion reamer reams exact-diameter holes to fit almost any size of soft metal bearings. Each size is supplied with standard-, and oversizering gages. Reamers are made in 32 standard sizes from 11/16 to 3⅝ in.

ROLLING PROCESS FOR REAMERS—*U. S. Tool and Mfg. Co., 6906 Kingsley Ave., Dearborn, Mich.* Procedure is offered for making standard and special high-speed reamers. High-speed steel cutter blades are secured in recesses of a tool by means of a rolling process which involves no application of heat as in welding or brazing.

REAMERS — *Severance Tool Industries, Inc., 726 Iowa St., Saginaw, Mich.* Carbide tool is for finishing centers after heat treatment. Micro-center reamers replace abrasive center polishing and center lapping and can be used in standard center-lapping machines, or drillpresses. They are available in ⅜- and ½-in. dia.

REAMERS—*Wendt-Sonis Co., Hannibal, Missouri.* Line of reamers known as Spe-D-Cut, embodies precision tolerances (0.0005 in. on the dia.) and diamond-lapped cutting edges. Reamers can be used both on ferrous and non-ferrous materials and come in 13 different diameters.

TOOLS FOR KEYWAY BROACHING—*Zagar Tool, Inc., 23880 Lakeland Blvd., Cleveland 23, Ohio.* Standard tools are offered for broaching keyways on short-stroke broaching machines. Keyways ⅛x⅛x4 in. long can be made on 20-in. stroke broaching machines, and keyways to 1x1½x6 in. long can be made on 36-in. stroke machines.



BROACHES—*duMont Corp., Greenfield, Mass.* Additions to the Minute Man keyway broach kit are for cutting standard keyway sizes approved by the A.S.A. Kits are available with carbon-steel broaches and with high-speed steel broaches. Bushings are provided for all hole sizes from ½ to 1 9/16 in. by sixteenths.

BLIND-HOLE ROTARY BROACH—*Shearcut Tool Co., Box 746, Reseda, Calif.* Rotary broaching is a technique developed for producing finished holes to exact size. Standard stock sizes are available from 3/16 to 1 in. in increments of 1/32 in. From 1- to 1½-in. stock sizes are available by 1/16th-in. increments.

FILE—*Nicholson File Co., Providence, R. I.* Machinist's general-purpose file is designed for use on aluminum, bronze, cast iron, malleable iron, mild steel and annealed tool steel. The single tool can rough and finish various metals. It has single cut teeth. Files are available in lengths of 8, 10, 12, and 14 in., in one degree of coarseness.

FILES—*Severance Tool Industries Inc., 726 Iowa St., Saginaw, Mich.* Cemented-carbide hand files featuring ground teeth are available having either 20 or 30 teeth per in., and in either ⅝- or 1¼-in. widths. File has handle-holder on which are mounted in tandem two carbide segments.

FILES—*Severance Tool Industries, Inc., 726 Iowa St., Saginaw, Mich.* Ground-carbide die-machine files make alterations or corrections on hardened dies, without the risks involved in annealing and rehardening. Dies as hard as Rockwell 63 C can be handled.

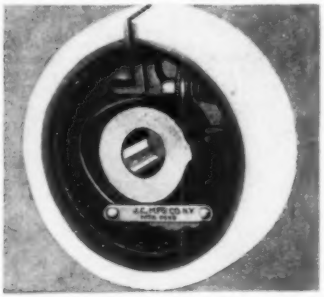
HACKSAW BLADE—*Millers Falls Co., Greenfield, Mass.* High-speed welded-edge hacksaw blade, said to be shatterproof and unbreakable is called the "Jet-Edge" and is said to allow faster speeds, without blade deflection.

SPIRAL SAW BAND—*DoAll Co., Des Plaines, Ill.* Spiral saw band with a hard cutting edge which spirals around the band features a tooth design that give a 360° cutting edge for cutting material in any direction without rotating the work. Spiral saws are available in two sizes: 0.040-in. dia., and 0.074-in. dia.

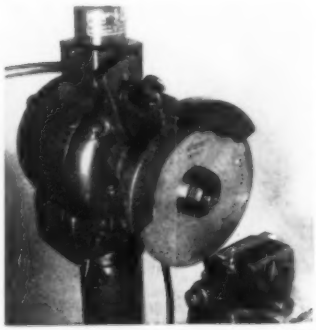
SAW—*V-W Specialists, Upper Darby, Pa.* Attachment for electric or air hand drills and flexible shafts, up to 1700 rpm., converts standard rotary motion into reciprocating action for sawing, filing. Called Clever Saw, all types of saw blades are usable from 3 to 4 in. long.

SAWS—*Circular Tool Co., Providence, R.I.* Tungsten-carbide-tipped circular saws, listed as the Circle R saws, are available in sizes from 2½ to 10 in. in dia. Diameters from 2½ to 4 in. come as thin as 1/16.

SAWS—*W. F. Meyers Co., Inc., Bedford, Ind.* Carbide-tipped circular saws, used for cutting plastics include both standard and fine-tooth saws with 8- to 18-in. dia.

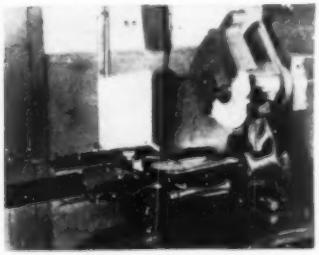


WHEEL—*J. C. Manufacturing Co., 259 Seventh Ave., New York, N. Y.* Abrasive wheel is offered to prevent accidents that occur when a sanding wheel opens or breaks while in operation. The safety abrasive wheel has a 5- or 6-in. O.D., a ⅞-in. bore, a 1½-in. wide abrasive, and a rotary locking mechanism.



WHEEL—*The Wickman Corp., 1553 Wilson Ave., Detroit 3, Mich.* Grinding of chip-breaker grooves in tungsten-carbide-tipped tools is done with the Wickman-Neven steel-bonded chip-breaker diamond wheel. Grooves from 0.020- to 0.040-in. depth can be ground in one pass.

CONTACT WHEEL—*Jackson Buff Corp., Long Island City, N. Y.* Airway ventilated contact wheel for abrasive-belt polishing is designed for contour or flat work. Wheels are available in 6- to 16-in. dia. in standard sections of ½-in. face.



WHEEL DRESSER—*Hoglund Engineering Co., Inc., 697 Selfmaster Parkway, Union, N.J.* Contour high-precision abrasive wheel dresser operates on a 10 to 1 ratio from a templet which controls the movements of the diamonds through a stylus. Errors in templet are reduced in a ratio of 1 to 10 through application of hydraulic principles.

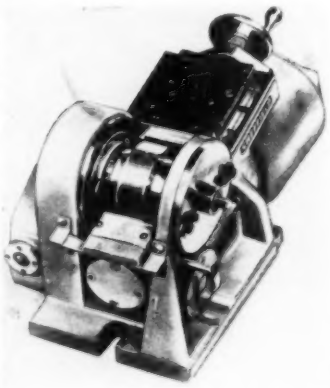
CONTACT WHEEL—*Divine Bros. Co., 200 Seward Ave., Utica 1, N. Y.* Abrasive belt-polishing contact wheel called Beltflex, is designed to eliminate the necessity of using buff sections under abrasive belts. It comes in two degrees of density, type E, offering flexibility, and type G, offering flexibility with aggressive cutting action.

DIAMOND DISK WHEEL—*K-E Industries, 235 Plymouth Bldg., Minneapolis 2, Minn.* Wheel features a replaceable diamond face. It can be used on ordinary bench grinders as well as carbide-tool grinders. Also offered is the Qualiset diamond setter, illustrated, which operates at 110-v. ac. circuit, and is capable of setting a diamond in less than a minute.

CONTACT WHEEL—*The Minnesota Mining and Manufacturing Co., St. Paul, Minn.* Contact wheel is designed for heavy grinding with abrasive belts at speeds of 10,000 sfpm. or more. Called the "K" contact wheel, it is made in 8- and 16-in. diameters in face widths of 2, 3, 4 and 6 in.

BELTS—*Minnesota Mining and Mfg. Co., St. Paul, Minn.* "Three-M-Ite" resin-bond cloth belts are available in widths to 18 in. and lengths from 60 in. up. It consists of aluminum-oxide mineral grains in grits from 24 to 120 coated on a flexible cloth backing with a resin bond.

WHEEL DRESSER—*Matco Tool Co., 2836-36 West Lake St., Chicago 12, Ill.* Wheel dresser for surface and cylindrical grinders is said to eliminate starting and stopping of machine, removing and replacing work on the chuck, lowering and raising wheel head, wheel and diamond accidents and locating diamond for dressing.



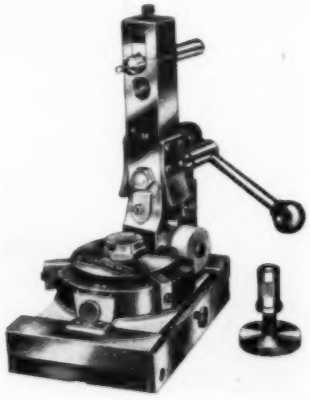
CRUSHING DEVICE—*Sheffield Corp., Dayton 1, Ohio.* Self-truing motorized crushing device for forming cast-iron rolls and grinding wheels is a self-contained, two-speed unit employing a carbide tool for dressing the form of a Meehanite or other close-grained cast-iron roll.

DRESSING TOOL—*Diamonds & Tools, Inc., 19345 John R Street, Detroit 3, Michigan.* C-7X dresser contains seven diamonds with a total diamond weight of between 1 1/3 and 1½ carats. The shank diameter is 7/16 in. C-7X is designed for dressing wheels on centerless grinders, large O.D. grinders and surface grinders.

GRINDING-WHEEL DRESSERS—*Crown Industrial Products Co., 1519 E. 53rd St., Chicago 15, Ill.* Tru-Dress grinding-wheel dresser removes irregularities in the wheel and improves cutting action. The Tru-Dress is available in two sizes; one with a 3-in. dia. emery wheel; and the other with a 4-in. wheel.

RADIUS DRESSER—*Perfex Gage and Tool Co., Mt. Clemens, Mich.* Direct-reading radius dresser featuring a ground micrometer screw permits setting from 2-in. convex to 2-in. concave radii. Each revolution moves the diamond 0.025 in. Dressing head is graduated each 5°.

DRESSING TOOL—*Clipper Diamond Tool Co., Inc., 21 West 46th St., New York 19, N. Y.* Cluster-type diamond dressing tool is available in two styles, R 20 and R 20-15. Tool has twenty small diamonds symmetrically inserted in a matrix and arranged in two circles of ten diamonds each.



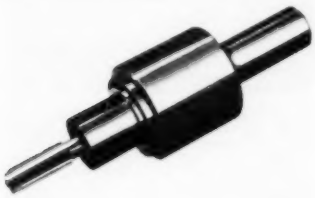
WHEEL DRESSER—*Matco Tool Co., 2834 W. Lake St., Chicago 12, Ill.* Model A radius and angle wheel dresser can form concave or convex radii with any two angles tangent in one continuous motion without stopping. Featured are micrometer feed to wheel, and a self-centering cam-action movement.

GRINDING WHEEL—*Norton Co., Worcester, Mass.* A resinoid-bonded, reinforced grinding wheel is called Norflex. Diameters available are 14 in., 16 in., and 20 in., in two thicknesses, 5/32 in. and 3/16 in.

DRY GRINDING BELT—*Behr-Manning, Troy, N. Y.* Heat-resistant dry grinding belt called Resinall Metalite, utilizes special heat-resistant, thermo-setting resin adhesives. It is said to increase production in a ratio of 4 to 1 over the regular glue-bond material for high heat-generating operations.

DIAMOND DRESSER — *Fish-Schurman Corp., 230 East 45th St., New York 17, N. Y.* Ball-nose Steelset diamond dresser has an impregnated diamond, sintered-steel bond. The area-type dressing and truing tools eliminate turning and rethreading.

THREAD CHASERS—*Jones & Lamson Machine Company, Springfield, Vermont.* Carbide-tipped die chasers with ground thread forms have a high quality finish with a class III tolerance. They are effective on steel, hard rubber, fiber and abrasive materials which have a rapid dulling action.

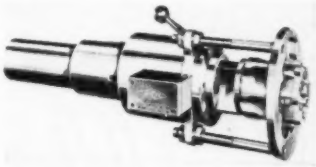


TAP HOLDER—*Empire Tool Co., 8774 Grinnell Ave., Detroit 13, Mich.* Floating-releasing tap holder incorporates a parallel and angular float and a releasing clutch and pullout. It is made in 2½-in. sizes to take taps from ¼ to 1¼ in. The shank is 1½x4 in.

TAP HOLDER—*Burg Tool Mfg. Co., Los Angeles, Calif.* Redesigned Tool-Flex Neoprene-mounted releasing tap holder is offered for tapping on turret lathes, drillpresses, screw machines, and engine lathes. Blind-hole tapping, or tapping to a definite stop, can be done by setting the turret to a travel.

GROUND TAPS—*Sheffield Corp., Dayton 1, Ohio.* Line of high-speed commercial and precision-ground taps, both standard and special, are offered. Standard 3- and 4-fluted and spiral-pointed hand taps, standard- and spiral-pointed machine screw taps are among those included.

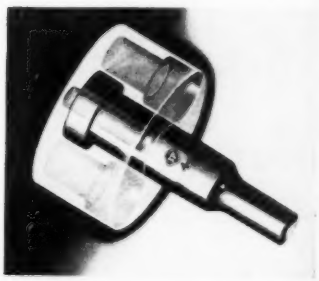
MULTI-FLUTED TAP—*The Hy-Pro Tool Co., New Bedford, Mass.* Multi-fluted tap for threading holes in all plastic materials handles hard and soft plastics with either cloth or glass fillers.



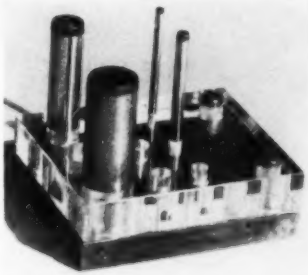
COLLAPSIBLE TAP—*The Landis Machine Co., Waynesboro, Pa.* Style LL receding-chaser collapsible tap for tapping tapered threads, is adjustable for thread length and can be used for American Tapered Pipe Threads or for any line pipe, tubing, casing, or drill-pipe threads, listed in the A.P.I. Standards, providing that threads are within diametrical capacity of taps.

TRIMMING DIE—*The Steel Products Engineering Co., Springfield, Ohio.* Brehm trimming die trims straight edges or edges with notches or projections. One die can trim a variety of shell sizes.

PRODUCTION SERVICE — *An-Dean Mfg. Co., Inwood, Ind.*, announces the Jiffy Production Service for punch-press shops which operate dies, jigs and fixtures. The service is a new process of tipping and centering salvaged die punches.

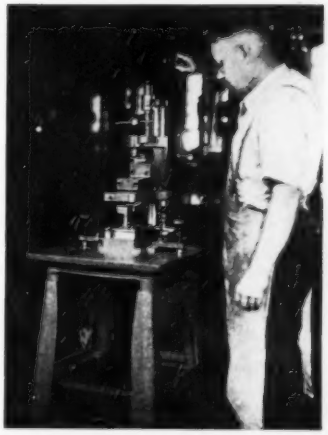


PUNCHES, RETAINERS — *Porter Precision Products, Cincinnati 12, Ohio, and distributed by Diemaker Supplies, Inc., Detroit 11, Mich.* Line of head-type punches and punch retainers is furnished in a minimum length of 1½ in., which is said to allow greater range of applications, required in short shut heights. A companion line of round-type retainers for these punches is optional in two sizes.

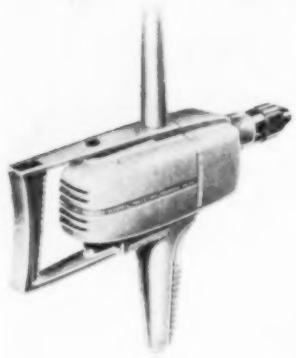


SHIM-STOCK PUNCH—*The M & M Co., 426 North Third St., Saginaw, Mich.* Allied precision shim-stock punch has a clear-plastic top enabling accurate alignment over the material to be punched. It provides for the following standard-size holes: ⅛, 3/16, ¼, 5/16, ⅜, 7/16, ½, ⅝, and ¾ in.

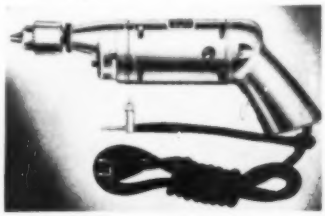
PUNCH—*Pioneer Broach Co., Los Angeles, Calif.* Two sizes, ⅝ in. and ¾ in. square chassis punches are claimed to permit punching square, rectangular, angles, or any square corner pattern-type hole from the nominal size up.



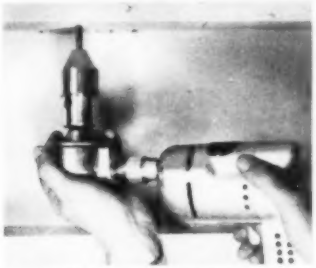
PUNCH-HOLDER REMOVER — *The Producto Machine Co., Bridgeport 1, Conn.* Punch-holder remover removes die-set punch holders from die beds with guide pins and separates assembled punches and dies. Machine is equipped with a 2-in. split-shank holder to clamp die set shanks.



DRILL—*Portable Electric Tools, Inc., 255-59 West 79th St., Chicago 20, Ill.* Portable electric drill listed as Model 509, offers a ½-in. capacity. It has a no-load speed of 400 rpm., and a full-load speed of 240 rpm. Capacity in steel is ½ in.



DRILL—*Portable Electric Tools, Inc., 255-259 West 79th St., Chicago 20, Ill.* A ¼-in. portable electric drill, Model 250, has a pistol-grip handle with a Cutler-Hammer trigger switch. It is air-cooled and of the universal type. No-load speed is 1400 rpm.; full-load speed, 600 rpm. Capacity in steel is ¼ in.



DRILLING ATTACHMENT—*E. H. Bertram Engineering Co., 3121 Main St., Kansas City, Mo.* Angle-head attachment permits drilling at right angles with an electric drill for hard-to-reach places. A specially designed ½-in. Jacobs chuck fits the Bull Buffer, which in turn fits the chuck of any electric drill.

DRILL—*Cummins Business Machines Corp., 4770 Ravenswood Ave., Chicago 40, Ill.* Model 200 portable electric ½-in. drill, weighing approximately 8 lb., is powered by a Universal motor reduced by helical gears to 550 rpm. spindle speed, and will operate on 115 v., ac. or dc.

ELECTRIC DRILL—*Milwaukee Electric Tool Corp., Milwaukee, Wis.* Pistol-grip type electric drill, the Hole-Shooter, is available in three different drill-size capacities and five different rated speeds (idle)—⅜ in. at 650 rpm., 5/6 in. at 1000 rpm., and ¼ in. at 2000, 3500, and 5000 rpm.

AIRFEEDRILLS—*Keller Tool Co., Grand Haven, Mich.* Line of Airfeedrill units is offered for multiple-drilling operations. The line consists of five units resulting in 34 speed combinations of stationary and portable units for drilling holes up to ¾ in. in diameter in mild steel, aluminum, brass, or plastics. Drills weigh from 3½ to 28 lb.

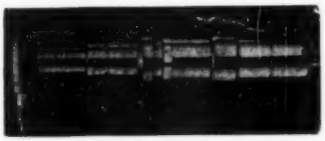
ENGLISH DRILL—*Fred L. Stuart, 309 E. 40th St., New York, N. Y., United States representative for S. Wolf & Co., Ltd., London, England.* A ½-in. electric drill is a tool for general production and maintenance. Motor frame and gear box are pressure die cast.

ELECTRIC DRILL—*S. Wolf & Co. Ltd., London, England, distributed by Fred L. Stuart, Room 1111, 33 W. 42nd St., New York 18, N. Y.* A ¼-in. lightweight production drill, listed as type EG2C, is adaptable to drilling in confined quarters. Drilling capacity in steel is ¼ in. Full load speed is 1400 rpm.

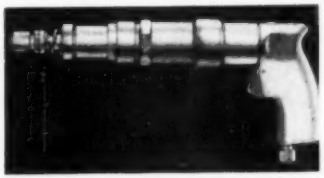
DRILL KIT—*Portable Electric Tools, Inc., 255 W. 79th St., Chicago 20, Ill.* Electric-drill kit, Hi-Power Model 77, consists of a ¼-in. portable electric drill and 10 high-speed drills in a steel, hinged-cover container.

SCREWDRIVER—*The Aro Equipment Corp., Bryan, Ohio.* Air-powered reversible screwdriver and nut setter, Model 7091, will drive No. 1 to 10 machine and wood screws, and ¼-in. nuts. The low free speed of 1000 rpm. insures contact with the screw slot. Working speed is approximately 750 rpm.

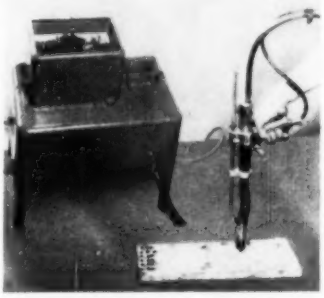
TAPPERS — *Aro Equipment Corp., Bryan, Ohio.* Push-pull tappers for portable tapping operations, re-tapping, chasing and cleaning of tapped holes, are automatically reversible. Operator pushes the tool for forward rotation and pulls for reverse.



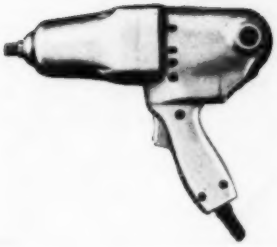
SCREWDRIVERS—*Rotor Tool Co., 17325 Euclid Ave., Cleveland, Ohio.* Midget shrouded screwdriver, M-1117, has double adjustable clutch with ¼-in. hex change. Midget right-angle nut setter or screwdriver, KRA-1, with ¼-in. 28 female thread and threaded shank is primarily for Phillips screws. The KRA-2, with right-angle head, illustrated, has a 9/32-in. square end.



SCREWDRIVER—*The Rotor Tool Co., 17325 Euclid Ave., Cleveland, Ohio.* Midget screwdriver, M-851, with pistol grip offers speeds of 1000 or 2000 rpm. A ¼-in. hex Quick-Change socket takes screwdriver bits to No. 12 screws.



SCREWDRIVER—*Reed Prentice Corporation, Dept. 26, 677 Cambridge St., Worcester 4, Mass.* Pneumatic, automatic screwdriver has been developed to feed screws, one at a time, from the hopper to the driver. Moving trigger automatically grips screw in driver after it is pneumatically delivered through a tube from hopper.



IMPACT WRENCH—*Black and Decker Mfg. Co., Towson 4, Md.* Portable electric ⅜-in. impact wrench will tighten or remove either left- or right-handed nut bolts and cap screws. The range of this tool is rated at ⅜-in. thread diameter.

SCREWDRIVERS, NUT SETTERS—*The Avo Equipment Corp., Bryan, Ohio.* Line of low-speed high-torque air screwdrivers and nut setters come in 12 models, No. 7060 to 7071 inclusive, in a range from 450 to 1100 rpm. Included are pistol-type and lever-type air tools.

NUT SETTER—*Illinois Gage and Manufacturing Co., 4639 W. Washington Blvd., Chicago 4, Ill.* The Speed-O-Matic Sales, Inc., announces a portable electric impact nut setter called the Speed-O-Matic. It tightens or removes nuts, bolts, studs and lag screws and can be used for drilling, tapping and similar operations.

IMPACT WRENCH—*Cleco Div., Reed Roller Bit Co., Box 2119, Houston, Tex.* Pneumatic impact wrench rated for ⅝-in. bolts is for bolting up, nut running, reaming, tapping, stud setting, and drilling. The wrench has no springs or other fragile parts, and is reversible.

IMPACT WRENCH—*Keller Tool Co., Grand Haven, Mich.* Air-operated impact wrench size No. 18-6, has a nominal capacity of ⅝-in. bolts. A rotary-type air motor furnishes speed.

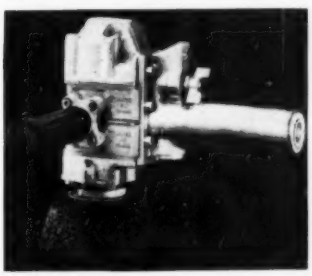
DRIL-HAMER—*Dril-Hamer Mfg. Co., Inc., 82-27 Grenfel Ave., Kew Gardens, L. I.* Dril-Hamer handtool is used to convert rotary motion of any ¼-in. electric drill, drillpress, or chuck-equipped flexible shaft, into hammering action for any purpose. Peening, riveting, boiler-scaling, paint-removal, and blank bits are available.

SCALING HAMMER — *The Rotor Tool Co., 17325 Euclid Ave., Cleveland 12, Ohio.* S-1 scaling hammer with a lever throttle can be used for weld-flux scaling, weld spatter removal, paint scaling, rust removal, and other applications. Chisels are furnished in blanks, flats and spoon shapes, and a full line of star drills is available in sizes of 3/16 to ¾ in.

HAMMER—*The Rotor Tool Co., 17325 Euclid Ave., Cleveland, Ohio.* Scaling hammer, with a graduated control in throttle gives choice of blows delivered. Tool can be used for weld-flux scaling and many other applications.

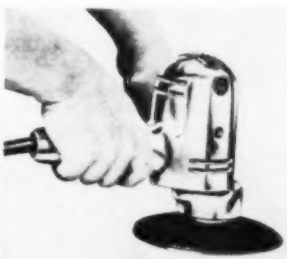
HAMMER—*Borm Mfg. Co., Elgin, Ill.* Pneumatic hammer for precision work at high speeds, called the Model G utility hammer, features a combination locking-type toolholder and trigger air control. Hammer is 8 in. long and will bore and stroke ⅞x⅝ in.

AIR-CHIPPING HAMMER—*Chicago Pneumatic Tool Co., 6 E. 44th St., New York 17, N. Y.* Small air-chipping hammer has a jet-blower device incorporated in the hammer. It is a positive air jet which cleans off a work surface as though a blow gun were built into the tool.



GRINDER—*Rotor Tool Co., 17325 Euclid Ave., Cleveland, Ohio.* Vertical grinder, model B-10, has a speed of 800 rpm. for 4-in. elastic wheels; 5000 or 6000 rpm. for 5-in. wheels. When sanding with 5-in. pads, speed is 8000 rpm., for 7-in. pads, 6000 rpm.

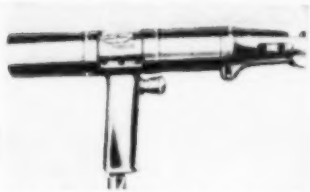
CUTTING TOOL—*Nord International Corp., 130 Greenwich St., New York 6, N. Y.* The Nibblex portable cutting tool for sheet metal is a maneuverable cutting tool capable of making circular cuts with radii as small as 1 in. Tool can be fixed in chuck of any ¼-in. motor in the same manner as a drill, and will cut sheet metal to 1/25 in. thick.



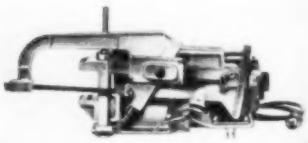
DISK GRINDER—*Porter Cable Machine Co., 1714 N. Salina St., Syracuse 8, N. Y.* Portable electric disk grinder will grind, polish, drill and cut by using a change of attachments. The Model D-6 will drill to a ¼-in. hole in metal. The model uses a 6-in.-dia. grinding disk.

PORTABLE TOOLS—*The Rotor Tool Co., Cleveland, Ohio.* A 360-cycle portable tool line is said to offer more power per unit of weight than the 180 cycle. Included are small wheel grinders, cone sanders, 4-, 6-, and 8-in. straight grinders, 6-in. cup grinders (illustrated), 7- and 9-in. sanders, and 9-in. polishers.

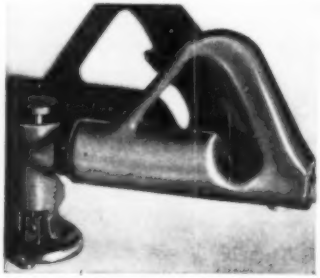
ROTARY GRINDERS—*A. Specken, Zurich; distributed by L. Kruger & Co., 75 West St., New York 6, N. Y.* Pneumatic grinders, Model Prs. 100 for 100,000 rpm., and Model Prs. 60 for 60,000 rpm. are equipped with entrance valves. Also offered are pneumatic grinders with rotary pistons for grinding, milling, filing, and similar operations.



SAW FILE—*Air Speed Tool Co., 1500 West Slauson Ave., Los Angeles 44, Calif.* Pneumatic saw and file offers positive shielding from entrance of abrasive elements during hard rough work by using redesigned breather holes. The reciprocating air valve has been replaced by a heavy-duty unit of improved design.



SAW—*Lipe-Rollway Corp., Syracuse, N.Y.* Lightweight portable power hack-sawing machine for operation from any 110-v. ac. outlet is called the Hand-i-hack. It is adjustable for cutting in a range from solid tough materials to thin-wall tubing. Vise capacity is 3x3 in., and will hold 2½-in. iron pipe.

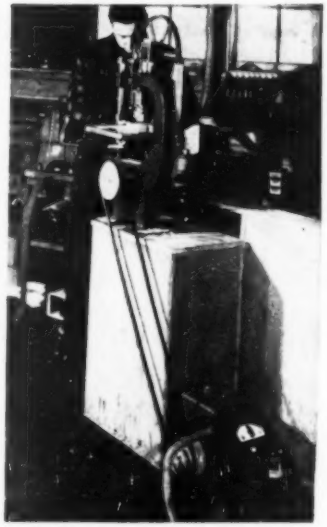


PNEUMATIC TOOLS—*Buckeye Tools Corp., Dayton, Ohio.* Pneumatic tools are known as the Stream-Power line. The horizontal grinders range in speed from 3000 to 22,000 rpm., weighing 1 to 12 lb., with capacities from ½- to 8-in. dia. Vertical grinders and sanders have speeds from 3000 to 6000 rpm., and grinding-wheel capacities from 4- to 6-in. dia.

RADIO HANDPIECE — *L & R Mfg. Co., Arlington, N. J.* Detachable radio handpiece with Jacobs' chuck for flexible-shaft machines may be used with any flexible-shaft unit. The aluminum-housed handpiece features a No. 0 Jacobs Chuck with 0 to 5/32 in. range.

FLEXIBLE-SHAFT MACHINE—*N. A. Strand & Co., 5001-09 North Wolcott Ave., Chicago 40, Ill.* Standard Roto-flex four-speed gear-drive flexible-shaft machines are available with speeds of 850, 1800, 3600, and 4500 rpm. With available attachments, it can be interchanged for diversification of operations.

POWER DRIVER—*Mines Safety Appliance Co., Pittsburgh 8, Pa.* Model V velocity power driver anchors pipe hangers and conduit boxes to structural plate or concrete. Threaded or headed studs are driven instantaneously. Energy contained in a small blank cartridge supplies the power.



MULTI-TOOL — *Continental Motors Corp., Detroit, Mich.* Multi-Tool, a light, portable power source with any speed from 1600 to 2600 rpm. has built-in speed control maintaining speed regardless of load, once control dial has been set. It will bore, sand, and grind, scratch, buff or polish, or operate clippers or shears.

FLEXIBLE-SHAFT MACHINES — *Stow Mfg. Co., Binghamton, N. Y.* Flexible-shaft machines, known as Lightnings, are light-duty machines adaptable to repair shops and welding and sheet-metal work. The line of machines comprises both ¼-hp. and ½-hp. 110-v., ac. 60 cycle, single-phase motors, with speeds of 1725 and 3450 rpm., mounted on a high pedestal.

PORTABLE POWER TOOLS—*Chicago Pneumatic Tool Co., 6 East 44th St., New York 17, N.Y.* A group of portable power tools, called the Super-Cycle line, includes high-speed electric drills, sanders, polishers, buffers, grinders, nut runners, and screwdrivers.

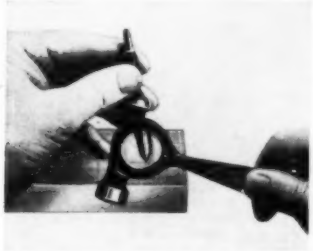
FLEXIBLE-SHAFT MACHINE—*Electro-Mechano Co., 261 E. Erie St., Milwaukee 2, Wis.* Speed-Right flexible-shaft machine will drive midget mills, rotary files, and other carbon and high-speed steel cutting tools. Positive speed control gives reduced speeds while maintaining maximum torque.

FLEXIBLE-SHAFT MACHINE—*Stow Mfg. Co., Binghamton, N.Y.* Streamliner flexible-shaft machine has shaft driven by V-belt stepped pulleys. Shaft is 6 ft. Mounting may be pedestal, suspended or low-mount type. Power varies from ½ to 1 hp. Speeds vary from 1150 to 6900 rpm.

SELF-WINDING REEL—*Aero-Motive Manufacturing Co., Kalamazoo, Mich.* Self-winding reel suspends portable tools for use on the production line and raises them out of the way when they are not needed. Called the Zoo self-winding balance reel, it can be hung from a beam or a cable in work position above the operator.

BALANCER — *The Aro Equipment Corp., Bryan, Ohio.* Balancer, for suspending portable tools in shop or production-line work, Model 7072, can be adjusted for balance on all types of portable tools weighing up to 10 lb.

FLEXIBLE-SHAFT MACHINE—*Elliott Mfg. Co., Binghamton, N. Y.* Improved flexible-shaft machine features a countershaft mounting spaced to give endwise yielding motion to the flexible shaft as motor assembly is tilted.

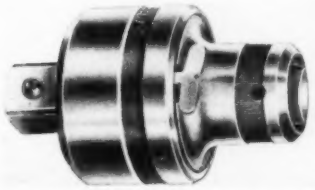


HAMMER—*L. S. Starrett Co., Athol, Mass.* Accurate spotting and punching of center lines and intersections is simplified by a tool and diemakers' hammer. A 7-power lens built into the head of the hammer eliminates fumbling.

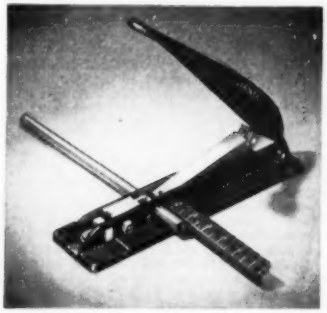
HACKSAW FRAME—*Miller Falls Co., Greenfield, Mass.* Hacksaw frame gives a lever action for tightening the blade, said to increase cutting speed and give longer blade life. The frame is made of 3/16x¾-in. steel.

FEEDING PLIERS—*Osborn Mfg. Co., 200 Argonne Rd., Warsaw, Ind.* Line of aluminum-alloy pliers for feeding stock into punch presses offers a tensile strength of 23,000 psi., elasticity of 6.38 and a brinell of 60. Pliers pulverize if caught in the die.

HAND POWER CUTTERS—*H. K. Porter, Inc., Somerville, Mass.* Line of hand power cutters has been redesigned. Improvements include curved toe-in handles which decrease arm-spread and wrist bend, and rounded palm-fit grip said to reduce fatigue.



RATCHETING TOOL — *Plomb Tool Co., Los Angeles 54, Calif.* Tool has a ½-in. square plug with ball-check for holding a socket wrench, a ½-in. square opening for insertion of a handle or attachment, and a reversible ratcheting mechanism. Called the No. 5447 Ratchetor, it can be used with varied handles.

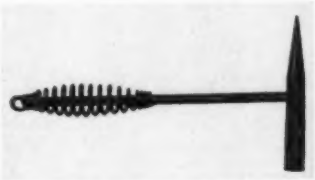


TOOLS, STOCK SPRING KITS—*Gardner Wire Co., 5045 W. Lake St., Dept. A-M., Chicago 44, Ill.* Tools and tool stock spring kits are for making small special looped or hooked extension springs. The Hook-Kon, Senior spring kit, provides tools and stock springs required to make many sizes of springs in lengths to 12 in., and up to 2½-in. dia.

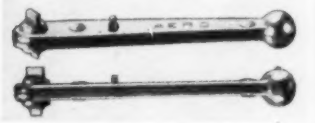
SOLDERLESS WIRING HAND TOOLS—*Aircraft Marine Products Inc., 1577 N. 4th St., Harrisburg, Pa.* Line of solderless wiring hand tools are for wiring applications requiring installation of solderless terminals by manually operated tools. They are called "Certi-Crimp."

WIRE STRIPPER—*General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.* Improved Speedex wire stripper, for stripping insulation from all types of wire from No. 8 to No. 30 has hardened-steel interchangeable cutting blades.

TOOL—*EMCO Enterprises, 6750 Stony Island Ave., Chicago, Ill.* Specialty tool for picking up parts in hard-to-reach places, the Flex-O-Pic consists of flexible cable shaft and two grabbing fingers. Tool is claimed to be acid proof and is cadmium plated.



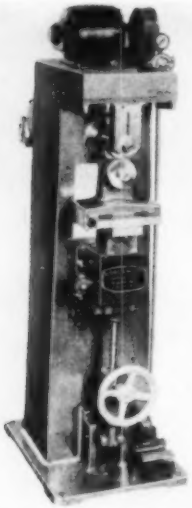
CHIPPING HAMMERS—*Atlas Welding Accessories Co., 707 E. Lewiston, Ferndale (Detroit), Mich.* Improved chipping hammers have hand-forged heads drilled half-way through and handles silver brazed into the hole. Flex-o handle, offering a coiled-wire design, is featured for slip-proof, stingproof grip.



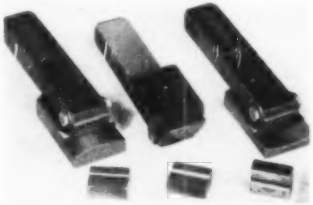
RATCHET SCREWDRIVER — *Aero Tool Co., 6930 Avalon Blvd., Los Angeles 3, Calif.* An offset ratchet screwdriver, listed as the No. 5200, is designed to permit the application of leverage to drive the screws, and to reach into areas that are not accessible ordinarily.

PLIERS—*Lapeer Mfg. Co., Lapeer, Mich.* Pliers have square-throat opening which permits thicker work to be inserted between the jaws to a greater depth. Known as Knu-Vise models, the two models offer an increased spindle diameter of ⅜ in. Model P-1200 provides 1200-lb. clamping pressure; Model P-1800 provides 1800-lb. clamping pressure.

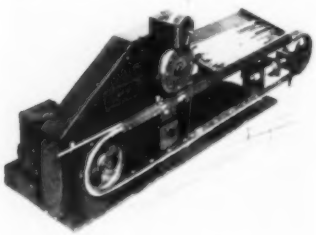
WRENCHES—*Dayton Rogers Mfg. Co., Minneapolis 7, Minn.* Die-cut custom-made wrenches in small lots are available from the smallest size to a maximum length of 20 in. in gage thickness of 1/32 to ¼ in.



MARKING MACHINE—*Noble & Westbrook Mfg. Co., East Hartford, Conn.* Power-operated graduating and marking machine, Model M-41, marks round parts such as dials for machine tools, running in sizes up to 8½-in. dia. Machine is equipped with a pneumatic cylinder, pressure regulator, and foot control.

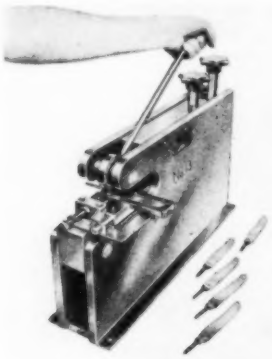


ANNULAR MARKING—*New Method Steel Stamps, Inc., 147 Jos. Campau, Detroit 7, Mich.* Line of locating-guide stamping devices for annular marking uses replaceable solid logotype, and can hand stamp around a flat radius. Locating guides are arranged for marking either from the O.D. or the I.D.



MARKING MACHINE — *Pannier Corp., Pittsburgh, Pa.* Machine prints numbers or letters on rod, bars, and tubing from ⅛-in. to 2-in. dia. Machine is powered by a ¾-hp. motor and includes hopper feed, quick-change printing wheel, belt conveyor, interior-feed ink supply and wear adjustments.

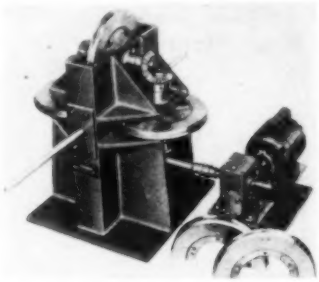
MARKING HOLDER—*M. E. Cunningham Co., 95 East Carson St., Pittsburgh, Pa.* Utility marking holder, for marking tags, keys, steel bars, and similar material ranges from ⅛-in. in increments of ⅛ in. up to 2-in. slots. Nine sizes of type characters form 1/32 through ¼ in. can be used in the same holder.



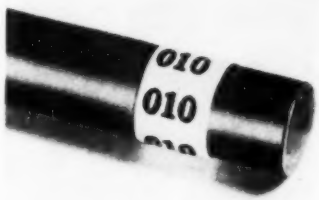
MARKING MACHINE — *The Acromark Co., Elizabeth, N.J.* Multi-lever spring-tension pressure-marking machine for marking cutlery blades and other tapered or beveled parts is constructed for mounting on work bench and marks finished blades by means of a roller die. Machine is 14 in. high, 6 in. wide, and 20 in. deep.

NUMBERING MACHINES — *Acromark Co., 7-13 Morrell St., Elizabeth, N.J.* Proportionately built automatic numbering machines are for fine consecutive numbering on small parts. Machine increases or decreases in size in proportion to the size of characters and number of wheels.

MARKING NAMEPLATES—*The Acromark Co., Morrell St., Elizabeth 4, N. J.* Fixture for gripping, stamping and releasing special nameplate shapes has a flange at the rear which slips under stamping bar of standard machines or the unit may be bolted into position. Various sizes are available.

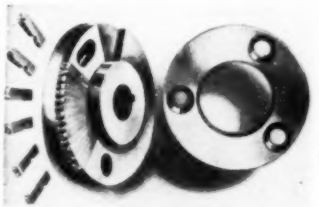


MARKER—*Pannier Bros. Stamp Co., Pannier Bldg., Pittsburgh 12, Pa.* Master Marker for stamping seamless and lightwall tubing, stamps 1, 2, 3, or 4 sides on the same run at a rate up to 300 fpm. It also handles bars in round, square, hexagon, and other shapes and in sizes from ¾- to 2-in. dia.



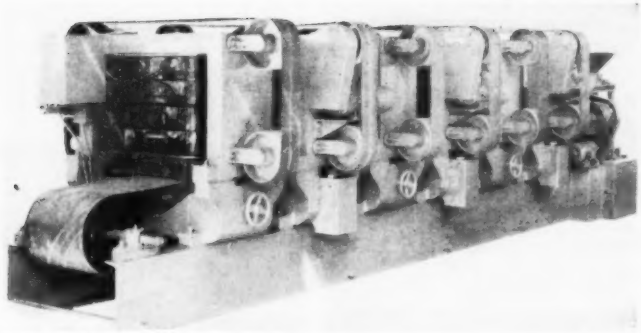
MARKERS—*Western Lithograph Co., 600 East Second St., Los Angeles, Calif.* E-Z code wire markers are used to identify raw metals and are tough adhesive strips that adhere to any metal surface and are unaffected by temperature, humidity, and handling.

MARKER—*New Method Steel Stamps, Inc., 17 Jos Campau, Detroit 7, Mich.* Multiple straight-line stamping of letters and figures is accomplished by a marker whose lines of type are interchangeable. Individual type is set into holder in same way as type is set in a print shop.

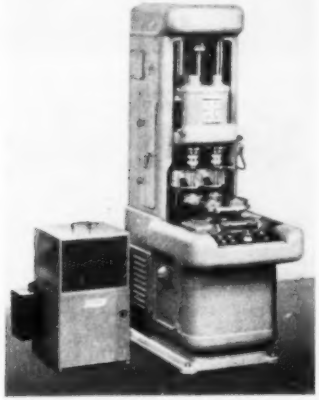


MARKING HOLDERS — *The Acme Marking Equipment Co., 8030 Lyndon, Detroit 21, Mich.* Line of roll-type holders combine the advantages of roller dies and interchangeable inserts. Holders are available in any size for use with marking machines or lathes.

HOLDER—*Acme Marking Equipment Co., 8030 Lyndon, Detroit 21, Mich.* Steel stamp holder for marking parts where it is undesirable to stock a quantity of different stamps or where information to be stamped may be altered from time to time is available for hand use, and can be had with a press shank for machine operation.



SEPARATOR—*Dings Magnetic Separator Co., Milwaukee, Wis.* High-intensity cross magnetic separator, type E, is offered for concentration and purification of magnetic and non-magnetic materials.

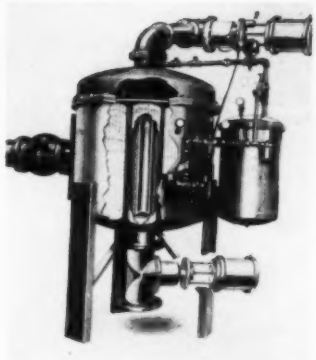


COOLANT COOLER—*Frostrode Products, 2373 E. Eight Mile Road, Hazel Park, Mich.* A 5-gpm. coolant cooler, Model 50-AC is for grinding, honing, and machining operations. It is designed to continuously maintain coolant temperature at a maximum of 20° below room temperature at rated capacity.

LUBRICATING COMPOUND—*G. W. Smith & Sons, Inc., 5400 Kemp Rd., Dayton 3, Ohio.* Die Slick No. 4 is a lubricating compound for die-casting machines and dies. Lubricant can also be used for ejector and guide pins on pressure die-casting dies, and on all movable parts of permanent models.

CUTTING OIL—*Beacon Rust Proofing Co., 19 West 31st St., New York, N. Y.* Cutting oil, said to eliminate further rust-prevention treatment for tools, materials and machinery, called Ferox, is used one to 40 parts of clear water for most metals. Solution remains completely clear at all times.

MULTIPLE-PURPOSE FILTER — *W.G.B. Oil Clarifier, Inc., Kingston, N. Y.* The CT clarifier employs a replaceable filter cartridge which can be changed without the use of tools. Filter covers an area of practically 272 sq. in. when used with Lube oil and 238 sq. in. when fuel cartridges are used.



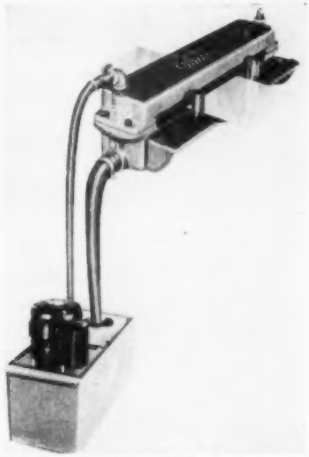
CLARIFIER — *Honan-Crane Corp., 609 Sixth St., Lebanon, Ind.* Automatic clarifier removes abrasives, dirt and other contamination from water-soluble coolants used in grinders, milling machines, and other metal-working tools. Coolant is filtered under pressure through mesh screens.

DIE LUBRICANT—*Acheson Colloids Corp., Dept. 13, Port Huron, Mich.* Die lubricant for press forging brass is a special dispersion of semi-colloidal graphite supplied in concentrated form and added to another fluid.

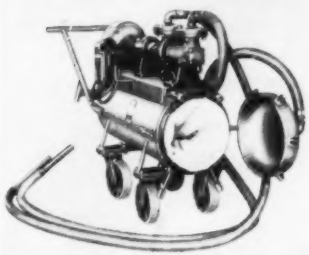
DRUM PUMP — *General Scientific Equipment Co., 2700 W. Huntingdon St., Philadelphia 32, Pa.* Drum pump for handling heavy greases or light fluids offers a special spider design of the piston and intake opening. Heavy greases are pumped at rates to 3 gpm. Pump is available in three models.

OILERS—*Oil-Rite Corp., 3466 S. 13th St., Milwaukee 7, Wis.* Multiple-sight gravity-feed oilers, feature central shut-off with individual drop-feed control. The Style DM oiler can be used for machine tools, punch presses, printing presses and other machinery.

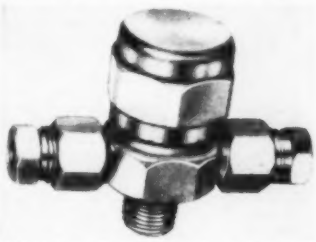
HEAVY LUBRICANT—*Keystone Lubricating Co., 2106 Lippincott St., Philadelphia 34, Pa.* Heavy lubricant is for open gears under extreme service conditions. Listed as the Keystone Grease No. 32, the lubricant is said to be effective through a wide range of temperatures. It is packed in leak-proof paper cartridges which fit in a specially designed gun applicator.



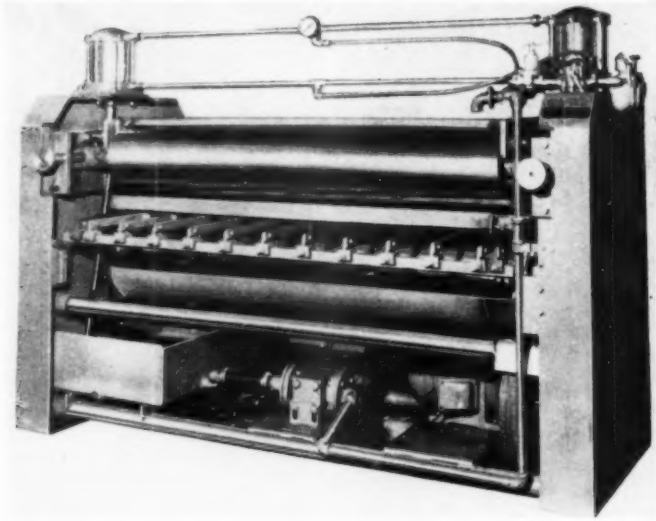
STOCK-OILING UNIT — *Graymills Corp., Evanston, Ill.* Automatic pressure-feed stock-oiling unit for punch presses consists of a force-feed lubricator and a portable pumping unit. The unit can be used on roll-feed or strip-feed applications. Oiler is made in three sizes to handle stock with max. widths of 6, 12, and 24 in. and max. thickness of 3/16 in.



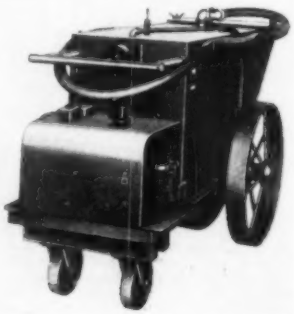
COOLANT FILTER — *Honan-Crane Corp., 909 Sixth St., Lebanon, Ind.* Mobile machine-tool coolant filter is powered by its own motor and vacuum pump and operates on a continuous circulation arrangement from a suction hose through the filter tank and discharge hose. Flow rate is 12 gpm.



VALVE — *Titeflex, Inc., 535 Frelinghuysen Ave., Newark 5, N. J.* Lubricator valve delivers a metered amount of oil or grease to each bearing in lubricating system. Listed as the Grannan lubricator, it dispenses all lubricants from light oil to heavy greases.



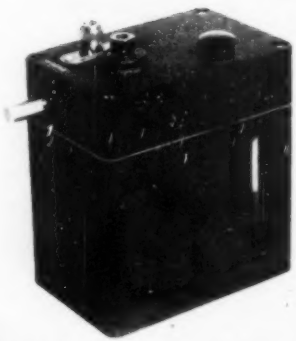
ROLL-COATING MACHINE—*Bertsch Machinery Co., 2832 East Grand Blvd., Detroit 11, Mich., Dept. H.* Roll-coating machine is for the application of drawing compound to sheet steel. Up to ¼-in. thick and any length can be coated in widths ranging from 24 to 72 in. Machine is said to insure applications of the compound on either or both sides of the blank simultaneously.



SUMP CLEANER — *Honan-Crane Corp., 909 Sixth St., Lebanon, Ind.* Redesigned sump cleaner for removing chips, grinding, cutting oil or soluble coolant from machine-tool sumps, or scale from quench and settling tanks, transfers oil or coolant from sump to tank by vacuum. No contaminated liquids pass through the pump.

LUBRICANT POWDER—*Alpha Corp., Greenwich, Conn.* Molykote is a dry lubricant consisting of molybdenum disulfite powder. It has a low friction coefficient, and prevents galling, seizing, or metal-to-metal contact at bearing pressures over 100,000 psi.

COOLANT — *Arnold & Hoffman Co. Inc., Machine Tool Specialty Div., Canal and Waterman Sts., Providence 1, R. I.* Ahcowet C G is a coolant said to penetrate the porosity of grinding wheels and cutters, resulting in longer tool life and cooler working.



AUTOMATIC LUBRICATOR — *Bijur Lubricating Corp., 45-01 22nd St., Long Island City 1, N.Y.* Type M lubricator for installation within small machines is said to oil to 100 bearings with measured regularity. Unit is automatically driven and can be adjusted to discharge from 2.5 to 5.5 cc. at each pump impulse.

THERMAL OILER—*Trico Fuse Mfg. Co., 2948 North 5th St., Milwaukee, Wis.* Automatic oiler for solid, wick, or waste-packed bearings, is designed for installation where space between oil hole and machinery is limited. Off-center feed spout makes mounting possible where clearance is as small as ⅛ in. Sizes available are 1, 2 and 4 oz.

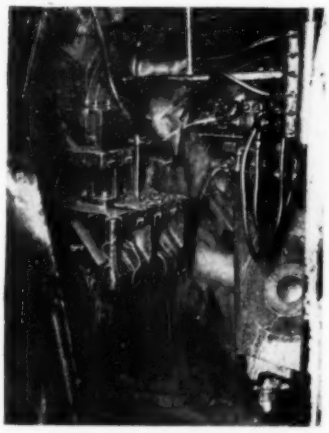
OIL STANDBY EQUIPMENT—*Surface Combustion Corp., Toledo 1, Ohio.* Oil standby equipment for use with gas-burner equipment utilizes No. 3 furnace oil (or lighter) which gives the same Btu. input per hr. as is provided with the gas burner equipment.

BLACK SATIN OIL—*G.K.W. Oil Co., 276 Mill Hill Ave., Bridgeport 8, Conn.* Black satin oil is for machining heat-treated steels of 125,000 tensile strength or better. The oil is said to allow tools to cut at reduced temperatures leaving a smooth finish.

COOLANT — *Machinery Lubricants, Inc., 31 St. James Ave., Boston 16, Mass.* Universal grinding coolant, the Silver-Chip No. 2 precision grinding compound is designed to handle steel, copper, aluminum, brass and cast iron. Coolant is said to eliminate rust, and reduce wheel dressing. It is a non-foaming translucent solution.

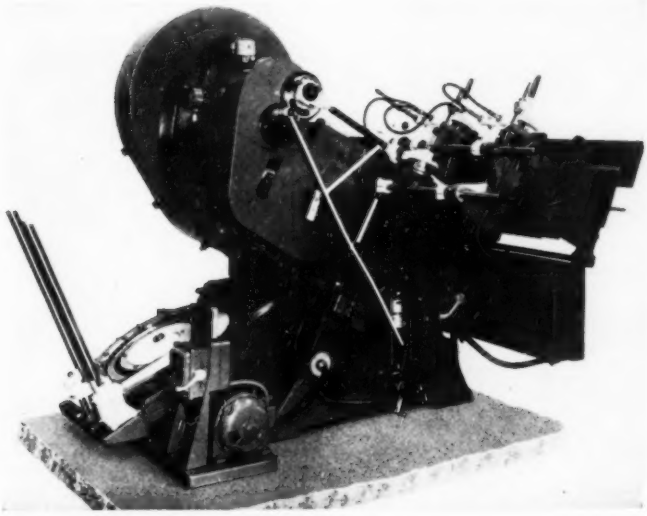
LUBRICATORS—*Shell Oil Co., 50 W. 50th St., New York 20, N.Y.* Drill lubricator, and saw-blade lubricant are offered, designed for use with hand-operated automatic drills up to ½ in. Package design allows a rotating drill to be inserted through its top cover into the lubricant.

CUTTING FLUID—*The Metal-Clean Solvent Corp., 1935 N. Paulina St., Chicago, Ill.* High-grade cutting fluid listed as No. 16 incorporates superfatted materials compounded under laboratory control, and offers cooling, lubricating, wetting, and rust-prevention properties. It is recommended for all types of ferrous and non-ferrous metals.

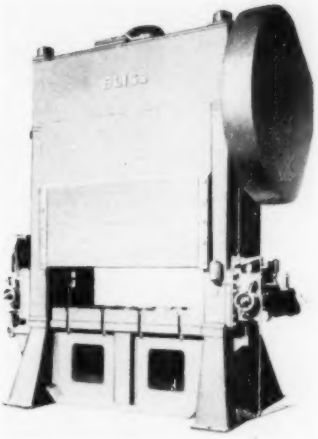


ALL-PURPOSE BASE—*E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.* Cutting-oil base can be diluted with either oil or water. Base is high in both sulphur and saponifiable content and is said to be suitable for more than 90% of metal cutting and forming operations, including general machining, automatic screw machines, stamping, and drawing.

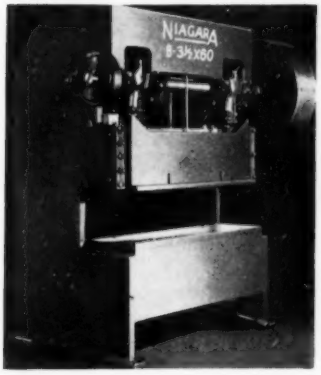
Forming, Forging, Casting



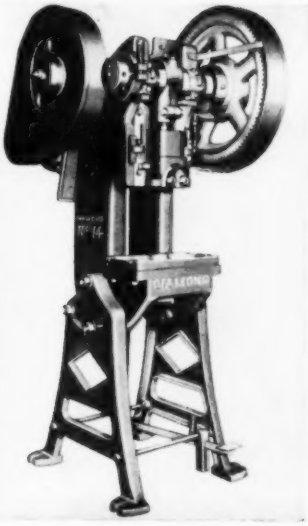
PRESS — *Lima-Hamilton Corp., and built by the Hooven, Owens, Rentschler Co. Div., Hamilton, Ohio.* Automatic strip-feed press for medium- and high-speed production, is designed for the can-making industry, and made for either single or double dies, or multiple die work with special slides. Listed as the Hamilton-Kruse Model No. 301, press has a 25-ton capacity.



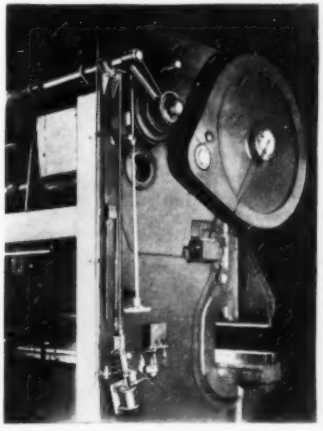
PRESS—*E. W. Bliss Co., 450 Amsterdam Ave., Detroit, Mich.* 300-ton press is used to form floor-panel reinforcements in eight steps of a progressive die. Called No. 6290-D, it is automatic with double-roll feed and scrap shear synchronized for feeding and trimming predetermined lengths. Press has 30 to 45 strokes per min., and die space from bed of 23½ in.



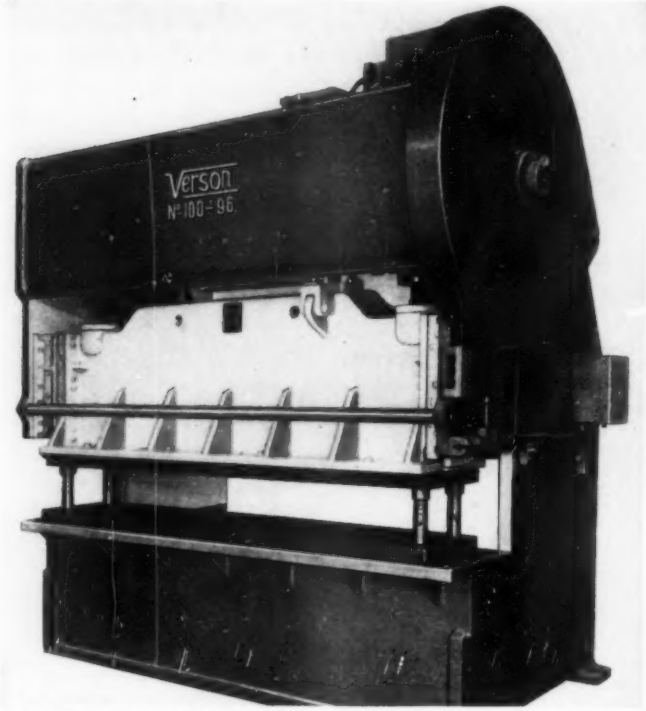
PRESSES — *The Niagara Machine & Tool Works, Buffalo, N. Y.* Line of welded-steel gap-frame double-crank presses is suitable for use with fine blanking dies and for forming work. Presses are built in seven sizes ranging in capacity from 44 to 244 tons. Each size is made in five to six widths.



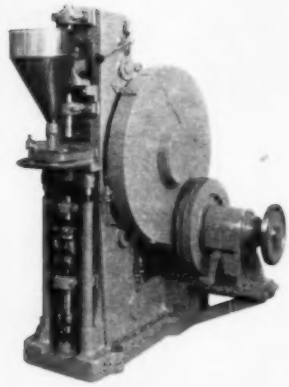
PRESS—*Diamond Machine Tool Co., 3429 E. Olympic Blvd., Los Angeles 23, Calif.* The 14-ton open-back inclinable geared press offers 65 strokes per min. max., a 2-in. standard length of stroke and a bed area of 8x15 in. Press has a non-repeat single-trip mechanism.



PRESSES—*The Cleveland Crane and Engineering Co., Wickliffe, Ohio.* Air-electric control is available as an optional feature on all Steelweld presses. With this control an air cylinder throws in the clutch which is ordinarily done by a mechanical treadle.

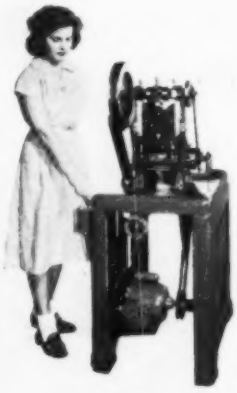


PRESSES—*Verson Allsteel Press Co., 1355 East 93rd St., Chicago 19, Ill.* Gang presses range in tonnage capacities from 100 tons to 350 tons in bed lengths from 72 in. Presses are designed for blanking, forming, punching, shallow drawing, and multiple operations whereby a series of operations can be done in one handling.

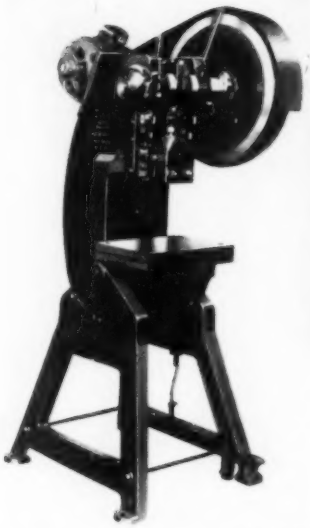


HIGH-SPEED PRESS—*F. J. Stokes Machine Co., 754 Drexel Bldg., Philadelphia 20, Pa.* 12-ton press is for high-speed manufacture of powdered metal parts. The G-4 press built of special Meehanite is capable of applying pressures simultaneously from both top and bottom. Maximum die fill is 4 in., maximum diameter of piece is 2¼ in.

ALL-STEEL STRAIGHT-SIDE PRESS—*Niagara Machine and Tool Works, 637-697 Northland Ave., Buffalo 11, N. Y.* Double-crank single-gear tie-rod frame press has a rated capacity near bottom of stroke of 185 tons.

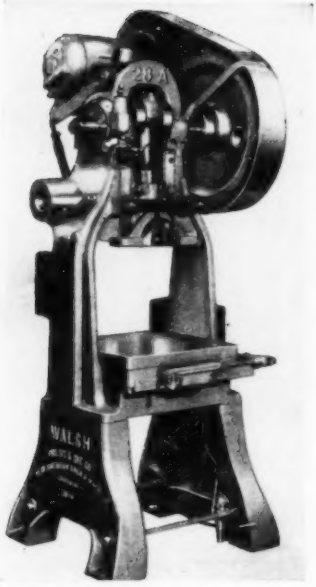


PRESS—*Ace Tool & Die Works, 129 E. McMicken Ave., Cincinnati 10, Ohio.* Flexopress is an automatic press for high-speed production of small parts. The machine offers a variable speed range from 50 to 600 rpm. and will cut production materials in uniform lengths to 9 in.

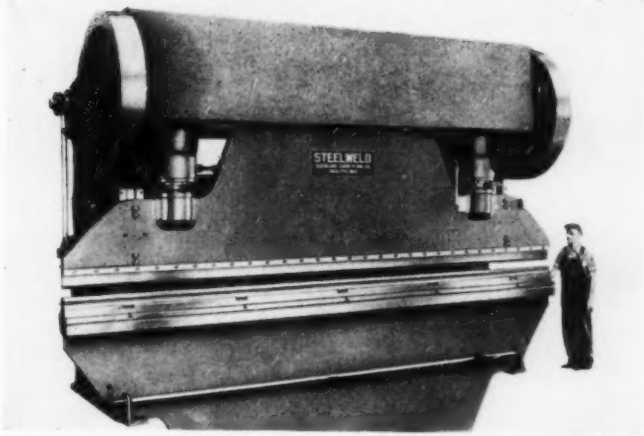


PRESSES—*Sales Service Machine Tool Co., 2363 University Ave., St. Paul 4, Minn.* Improved line of Press-Rite presses, and the No. 12, 12-ton press feature a single-stroke clutch, together with an automatic brake. Clutch can be used for continuous operation.

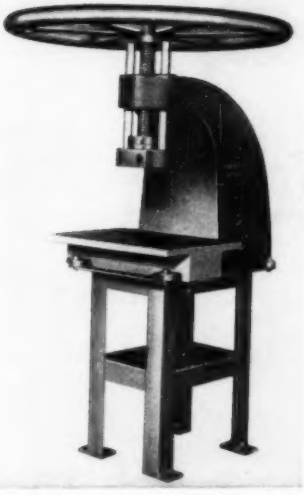
TENSION UNIT—*Black Industries, 1500 East 222nd St., Cleveland, Ohio.* Tension unit for web processing provides constant tension and constant velocity on a web of paper during printing. Similar machines can be used in the paper, plastic, and rubber industries and in the metal fabricating field employing coiled strip of ferrous or non-ferrous materials.



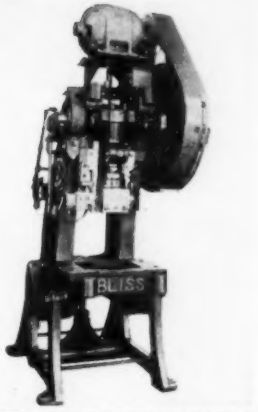
ARCH PRESS—*Walsh Press & Die Div. American Gage & Machine Co., 4709 W. Kinzie St., Chicago, Ill.* No. 28A arch press for die-casting trimming, forging trimming, plastic and rubber trimming, and the fabrication of sheet metal offers a bolster area of 23x24 in.; bed opening is 19x15 in. Distance between uprights is 24 in.



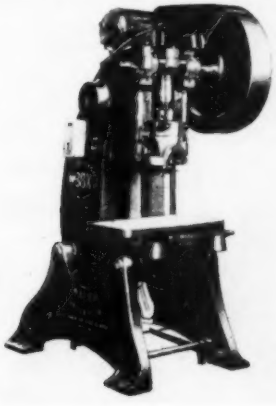
500-TON PRESS — *The Cleveland Crane and Engineering Co., Wickliffe, Ohio.* 500-ton press with a bed 20 ft. long, known as Model Mo6-14, has a ram which permits bending steel plate to 20 ft. x $\frac{3}{8}$ in. or 14 ft. x $\frac{1}{2}$ in. Horning operations are possible due to 21-in. bed extensions on each end.



PRESS—*General Mfg. Co., 6430 Farnsworth Avenue, Detroit 11, Mich.* Tryout press is for testing dies without using a production press. Large diameter handwheel, in combination with the high lead thread on the ram, enables the diemaker to move punch in and out of the die at the rate of 1.6 in. per rev.



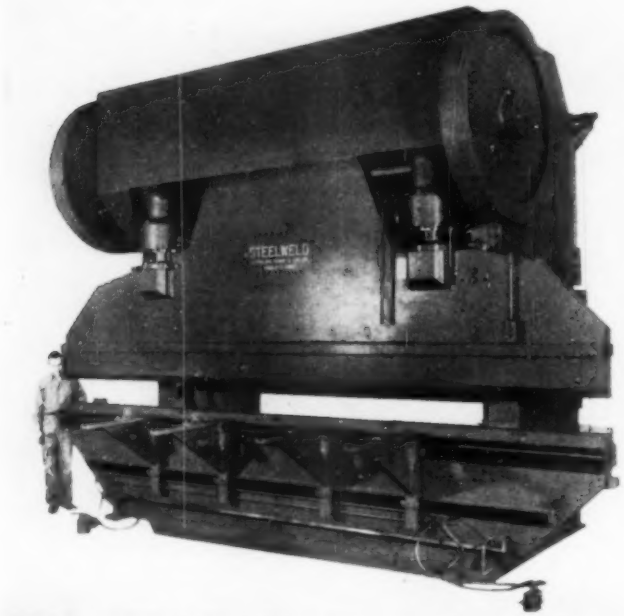
PRESSES WITH FRICTION CLUTCH —*E. W. Bliss Co., 450 Amsterdam Ave., Detroit 2, Mich.* Flywheel-type inclinable presses, as well as smaller geared sizes are equipped with the Bliss pneumatic friction clutch and brake. Presses can be stopped at any point.



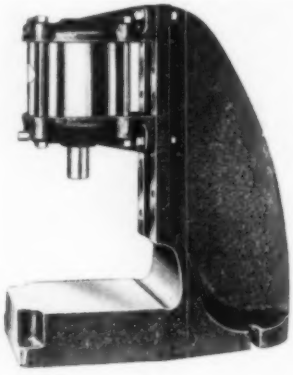
HORNING PRESS—*Service Machine Co., 7627-33 South Ashland Ave., Chicago 20, Ill.* A 25-ton Rouselle horning press has an adjustable bed table which can be raised to 6-in. die space for small dies or lowered to 17-in. die space for large dies. Standard bed table measures 14x20 in. and is furnished with an 8-in. hole.

SPRING MAKER—*The General Cement and Mfg. Co., Rockford, Ill.* Speedex spring maker is for production of springs of any diameter, pitch, number of coils, and other specifications. A simple screw adjustment varies the pitch.

PUNCH PRESS — *Walsh Press & Die Co., Div., American Gage and Machine Co., 4709 W. Kinzie St., Chicago 44, Ill.* Inclinable punch press with an open back has a capacity of 38 tons and is equipped with a variable-speed drive. Model 38X can be used as a toolroom and a test-run press, or for ←production.

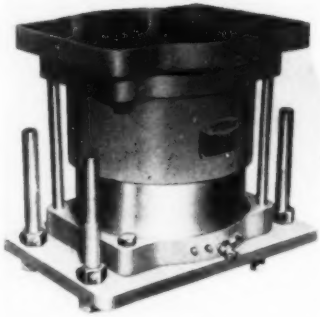


BENDING PRESS—*Cleveland Crane and Engineering Co., Wickliffe, Ohio.* The Steelweld bending press is 17 ft. 1 in. over-all in height, 2½ ft. of which is below the floor. Over-all length of the bed and ram is 20½ ft. which includes a 3-ft. extension at both ends.

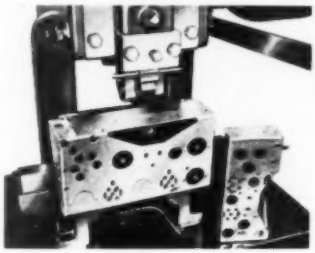


ARBOR PRESS—*The Bellows Co., Akron, Ohio.* Controlled-Air-Power arbor press called the Model BAP-20, is suitable for light to medium pressing operations such as forming, flaring, stamping, crimping and riveting. Press develops a thrust approximately 20 times the operating airline pressure. It can be used on 5 to 175 psi.

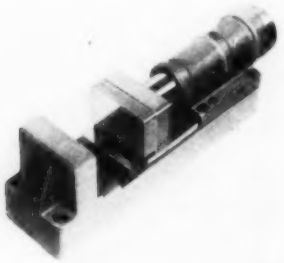
STAMPING—*The Acromark Company, Elizabeth, N. J.* Adjustable stamping fixture adaptable for use in any standard press is a casting on which is mounted adjustable steel slide blocks that permit the stamped part to be numbered on the end and side. →



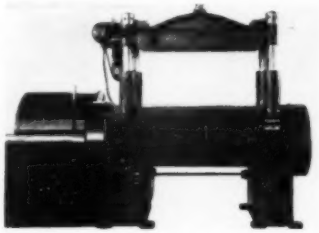
DIE CUSHION—*Dayton Rogers Mfg. Co., 2824 13th Ave., S. Minneapolis 7, Minn.* Pneumatic die cushion is for use where four suspension rods carry the mounting plate which supports the die-cushion cylinder. Listed as Model CBM, cushions are now furnished in ring-holding pressures from 1½ to 75 tons on a 100-lb. airline.



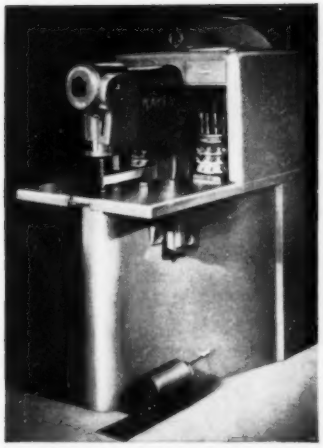
DEEP-THROAT PRESS—*Service Machine Co., 7627-33 S. Ashland Ave., Chicago 20, Ill.* A 15-ton Rousselle deep-throat press, No. 2-G, has been added to the line of open-back inclinable and adjustable bed-horn punch presses. An 18-in. throat permits working to the center of 36-in. sheets.



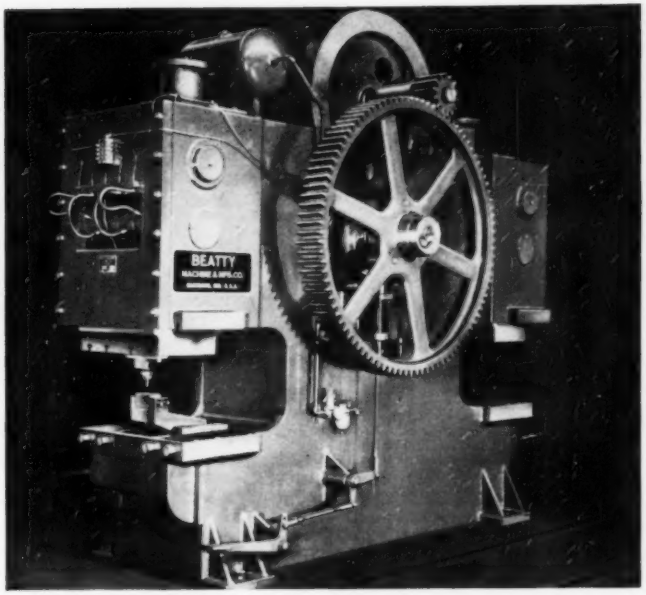
PUNCHING UNITS — *Progressive Welder Co., 3050 E. Outer Drive, Detroit 34, Mich.* Line of standardized hydraulic punching units have cylinders interchangeable on different bases. The units can be used for almost every production job involving punching, shearing, notching, trimming, or forming.



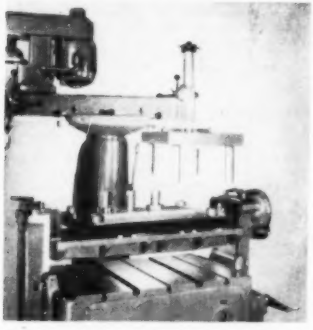
PRESS — *Apha Tool Works, 9281 Freeland Ave., Detroit 28, Mich.* 100-ton production-type die-tryout press operates at 60 strokes per min. The head lifts out of position by electric control and inverts so that both members of die are accessible for finishing work. Press has a 6-in. stroke.



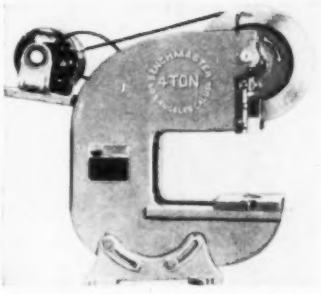
FABRICATOR — *Wales-Strippit Corp., North Tonawanda, N. Y.* Sheet-metal fabricator punches, notches, nibbles, bends, forms and blanks. Wales self-contained units form the nucleus of the fabricator.



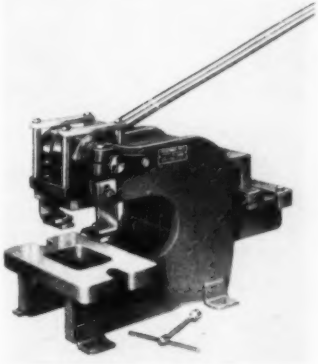
PUNCH—*Beatty Machine and Mfg. Co., Hammond, Ind.* Double-end punch employs welded steel instead of cast construction in addition to shortening the distance from punching centers from 12 ft. to 9 ft. The No. 9 punch has a 24-in. throat at each end.



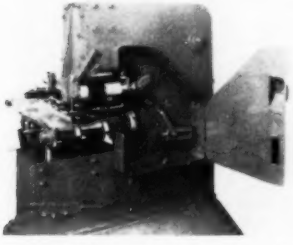
DIE FLIPPER—*Moore Special Tool Co. Inc., Bridgeport, Conn.* The die flipper will take apart and turn over a die set 20x40x12-in. shut height, pins engaged in bushings 4 in. In addition one die-maker can drill, tap, and try out, the punchholder and die shoe always being clamped securely to the machine.



PUNCH PRESS—*Benchmaster Manufacturing Co., Los Angeles, Calif.* Deep-throat punch press of 4-ton capacity has a throat depth increased to punch to the center of a 17½-in. circle. The 1/3-hp. press may be used either with or without the 6x8x1-in. bolster.

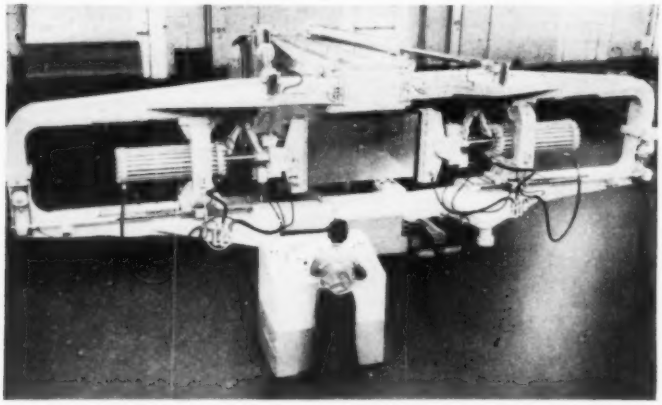


PUNCH PRESS—*The Leslie Welding Co., Dept. 00, 2943 Carroll Ave., Chicago 12, Ill.* Improved Model A hand punch press has no ram, ways, or slides, yet is said to have the accuracy of a leader-pin die set. Punch plate is 4x4⅝ in. Press throat depth is 6 in.; Stroke is 7/16 in., with an adjustment of ⅛ in.

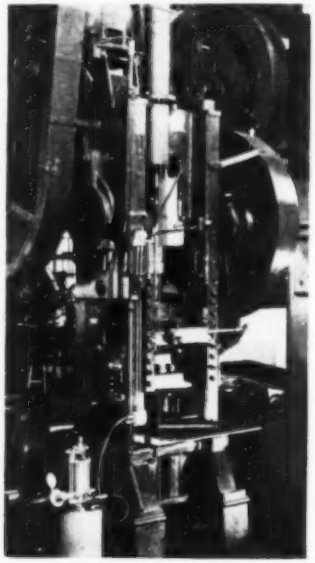


STAMPING PRESS — *Peerless Roll Leaf Co., Inc., Union City, N. J.* Roll-leaf hot stamping press listed as Model AH, is built exclusively for roll-leaf stamping. Speeds range from 10 to 60 impressions per min. Over-all size of the machine is 2 ft. 7 in.x 3 ft. 9 in.x5 ft. Head and die plate are each 6x7 in.

PUNCH—*O'Neil-Irwin Mfg. Co., Lake City, Minn.* Di-Acro double-purpose punch can be utilized for perforating holes of various shapes and sizes to 4 in. in diameter, and also used as a precision punch press for a variety of blanking, drawing, embossing, and ←forming operations.

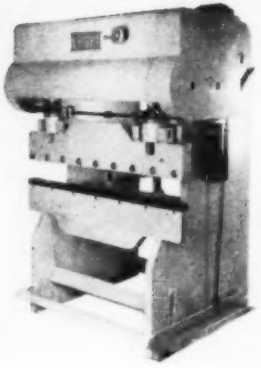


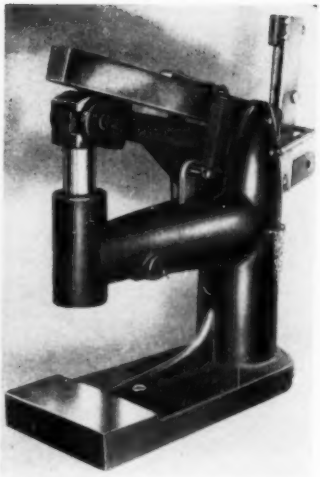
METAL STRETCHER—*Hufford Machine Works, Redondo Beach, Calif.* Metal stretcher handles heavy extrusions and stretch-forms sheet metal. The basic stretch-forming process consists of gripping a sheet of metal or a rolled or extruded section at each end in suitable jaws and stretching and wrapping over a die made to the required contour.



OVERLOAD PITMAN—*Dayton Rogers Mfg. Co., Minneapolis, Minn.* Hydro-pneumatic overload punch-press pitman with an automatic cutout, will automatically stop the press in event of overload. It can be applied to high-speed production work where the press is traveling at 500 to 1000 strokes per min.

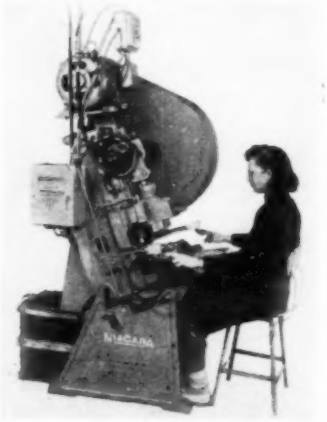
PRESS BRAKE—*The Knight Machinery Co., Indianapolis, Ind.* All-steel welded press brake, known as Model 14B72 with a rated capacity of 6 ft. of 14-gage mild steel, is equipped with Zerk-Alemite fittings, Cutler-Hammer controls, Reeves variable-pitch pulley drives. →



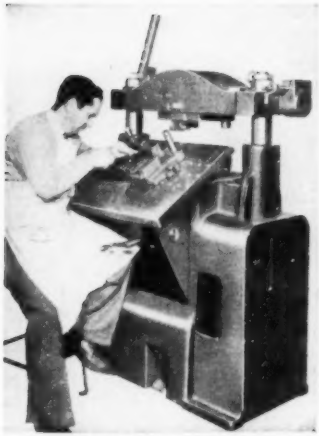


STAKING MACHINE — *The High Speed Hammer Co., Inc., 313 Norton St., Rochester 5, N. Y.* High-speed automatic staking machine is designed for staking or riveting fixed or movable joints and is adaptable to such operations as burring, and pointing with platinum, tungsten or silver. Four models are available in either manual or motor-driven types.

RIVETING MACHINE—*Schlack Mfg. Co., 13255 Birwood, Detroit 4, Mich.* Pneumatic riveting machine combines hammer action with rotation supplied by an air motor which operates off both line pressure and exhaust air from the four interchangeable-capacity ←heads.

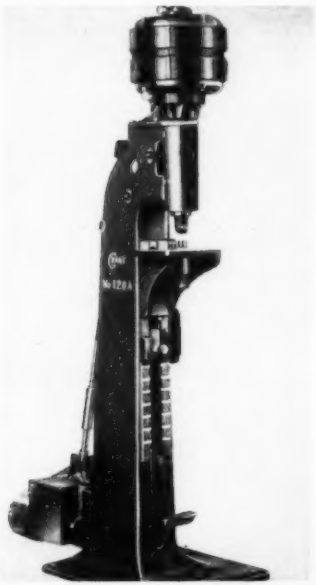


PROTECTION DEVICE — *Micro Switch, Freeport, Ill.* A safety device, the Microtrip, is for control of tripping mechanism on presses. The electrical device can be utilized for safe control of tripping mechanisms on punch presses, riveting machines, shears, spot welders and air presses. The Microtrip requires that both hands touch the switch buttons in order to operate the tripping mechanism.

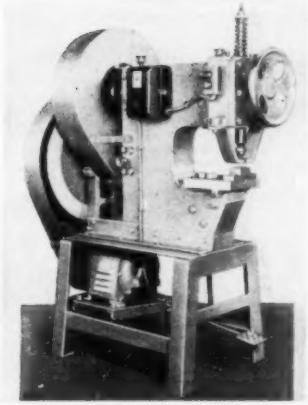


TRYOUT PRESSES — *Alpha Tool Works, Detroit, Mich.* Die-tryout presses for trying dies under actual production conditions (100 strokes per min.), has head and bolster that can be tilted so that final finish can be performed without removing dies from the press.

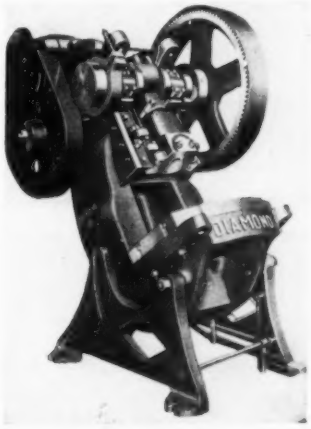
PUNCH PRESS — *Diamond Machine Tool Co., Los Angeles, Calif.* A 56-ton capacity back-geared punch press providing a slower stroke with heavy punching tonnage, is designed to strain-gage analysis. Frame is cradle mounted and can be inclined up to 35°. A non-repeat trip mechanism is featured. →

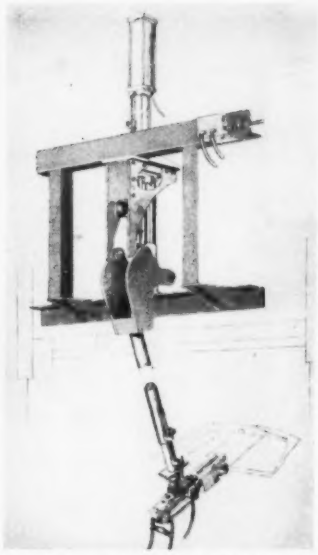


RIVET - SPINNING MACHINE — *Grant Mfg. and Machine Co., 85 Silliman Ave., Bridgeport 5, Conn.* Automatic-trip mechanism for use on three of company's noiseless rivet spinning machines enables operator to form heads on rivet shanks in 1 to 2 sec.

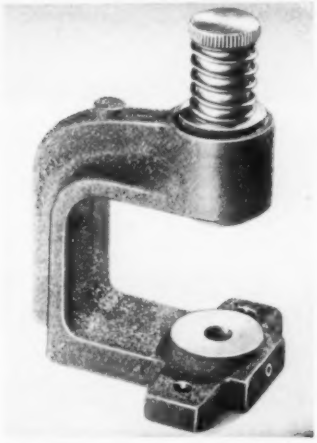


PUNCHING MACHINE—*Julius Blum & Co., Inc., 432-540 W. 22nd St., New York 11, N. Y.* Model P9 quick-acting single-end punching machine is adapted for punching the web and flanges of small beams and channels such as are used in railing, stair, and fire-escape work. Capacity in soft steel is 9/16 in. to ½ in. and ¾ in. to ⅞ in.



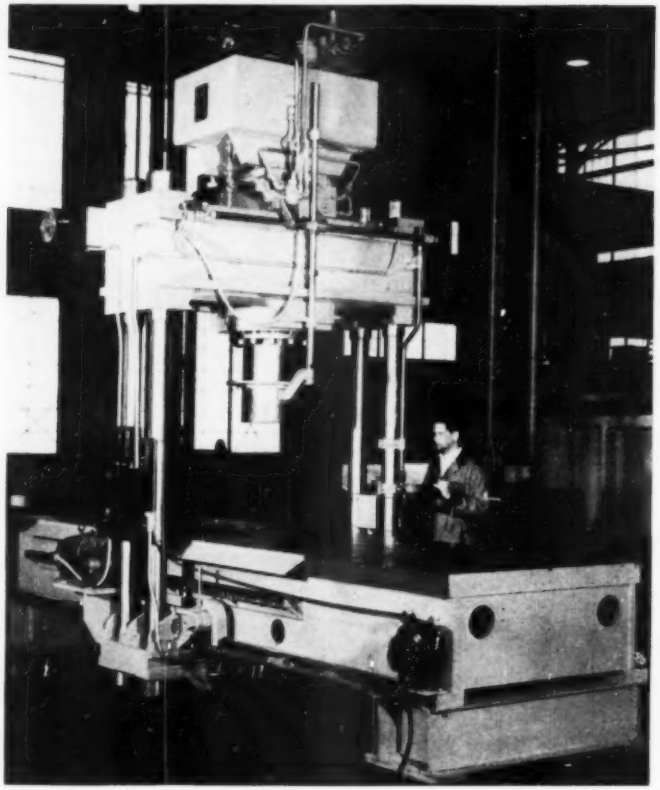


PRESS UNLOADER—*The Sahlin Engineering Co., 467 South Woodward Ave., Birmingham, Mich.* Iron-Hand press unloader enables speedy removal of sheet-metal stampings from medium-sized straight-side presses (with a 36-in. bed and about 100-ton capacity) and larger presses.



SUB-PRESS—*Paragon Metal Products, 844 W. Adams St., Chicago 7, Ill.* Line of sub-presses for use with kick, arbor, air or punch presses called the Paragon self-aligning sub-press, is said to increase productivity by eliminating the need for complicated setups for staking, piercing, and assembling operations on small parts.

SPECIAL MACHINE—*Snyder Tool & Engineering Co., 3400 E. Lafayette, Detroit 7, Mich.* Special machine, automatically inserts 12 rivets in an automotive-wheel assembly. The wheel assembly is located on the fixture and thereafter the operation is entirely ←automatic.



STRAIGHTENING PRESS—*The Hydraulic Press Mfg. Co., Mount Gilead, Ohio.* 200-ton hydraulic press for straightening weldments, castings and other large area parts, allows maximum pressure at any point within a 120x38-in. area of the bed. Pressure ram is movable in a horizontal plane along bed and also can be traversed at right angles to bed.

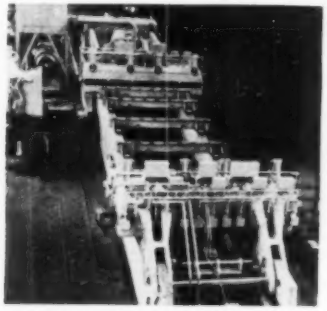
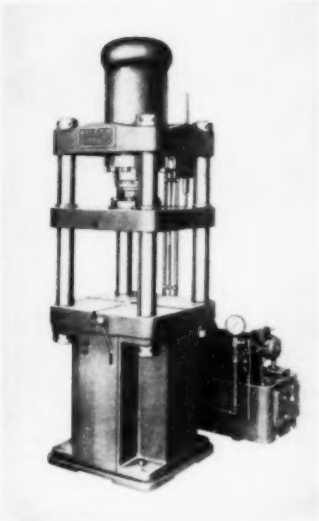
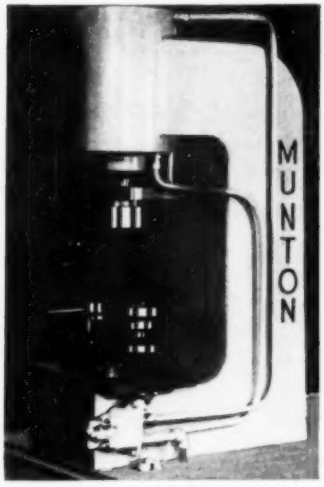


PLATE - STRETCHER - LEVELER—*Hydropress, Inc., 570 Lexington Ave., New York 22, N. Y.* The 1000-ton hydraulic plate-stretcher-leveler handles plate and sheet up to 11x31 ft. The unit is a self-contained oil-hydraulic type. A plate support, consisting of five movable carriages, facilitates loading and unloading.

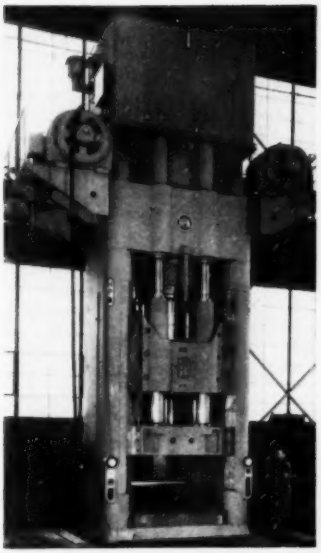
IMPACT PRESS—*The Bellows Co., 222 W. Market St., Akron, Ohio.* Air-operated impact press of medium-heavy type for assembling, flanging, marking, and similar work, uses a Bellows BM-10 integral-valve air motor for compression of a heavy die-type spring from which ram force is derived. Impact pressure can be regulated from a few ounces to a maximum of 6500 psi.



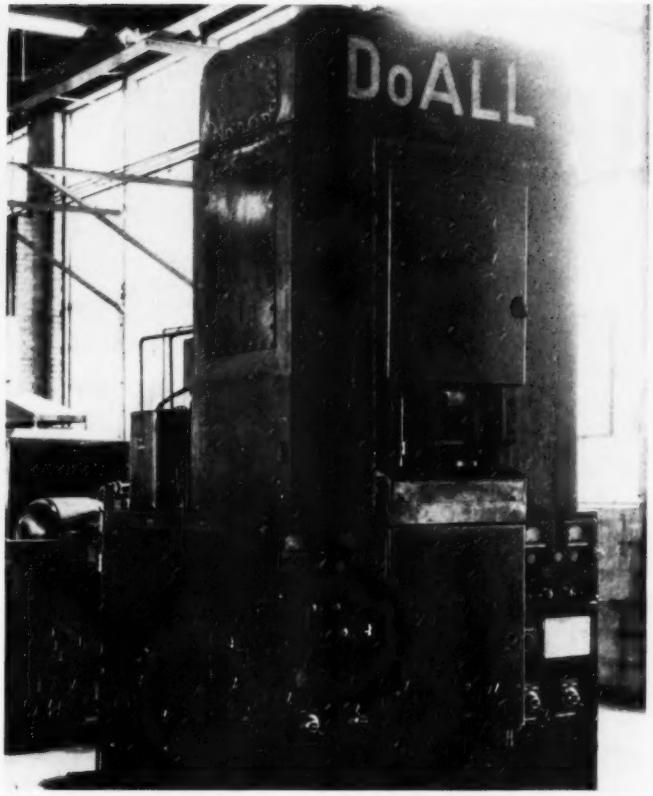
HYDRAULIC PRESSES — *Hannifin Corp., 1101 S. Kilbourn Ave., Chicago 24, Ill.* Standardized line of hydraulic presses are designated as Series S straightening presses, Series F forcing presses and Series C column-type presses. Series S presses are produced in seventeen different models while Series F open-gap forcing presses are offered in ten models. Both feature Sensitive Pressure Control as standard equipment, permitting varying of ram pressure in proportion to pressure on control lever. Series C four-column presses are built in 48 models in capacities ranging from 6 to 150 tons.



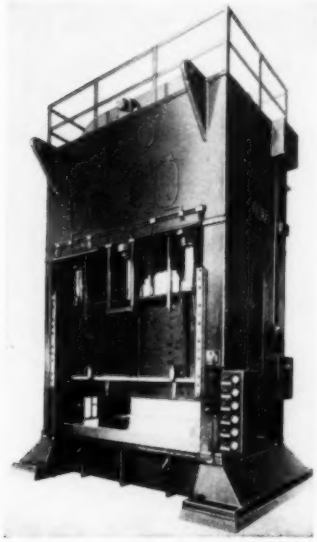
AIR PRESS — *Munton Mfg. Co., Franklin Park, Ill.* High-speed air presses for riveting, drawing light materials, forming and operations on product requiring light, fast work, are available in capacities of ½, 1, and 2 tons at 80-lb. air-line pressure.



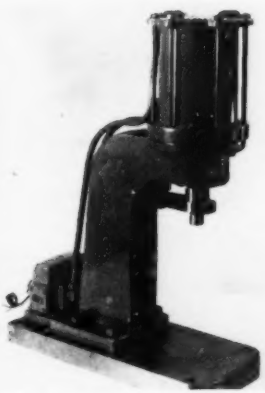
DEEP DRAWING PRESS — *The Hydraulic Press Mfg. Co., Mount Gilead, Ohio.* Double-action hydraulic deep-sheet-metal drawing press for deep drawing long cylindrical tanks used for storing gas and liquids weighs 7 tons and is 34½ ft. high. Pressing surfaces for mounting dies are 72x72 in. Press will draw sheet-metal parts to a depth of 4 ft.



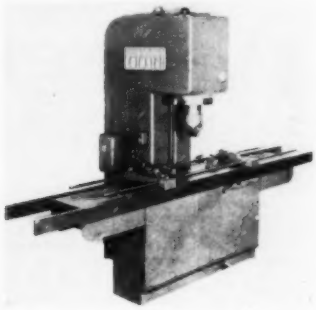
PRESS—*Continental Machines, Inc.*; offered by *DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill.* 30-60 ton metal powder press, applies pressures from the top and bottom as well as side pressures simultaneously through hydraulic cylinders. Shapes either solid or cored can be handled. Unit is automatic for high-production runs.



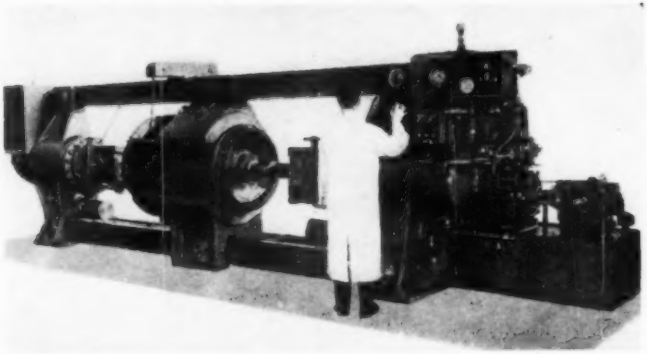
DEEP-DRAWING PRESS — *Verson Allsteel Press Co., 1355 E. 93rd St., Chicago 19, Ill.* Line of double-action deep-drawing presses for ferrous and non-ferrous metals listed as the Type MH, is designed to combine the high-productive capacity of a mechanical-drawing press with the adjustable blankholder in a hydraulic press.



ARBOR PRESSES—*Hannifin Corp., 1101 S. Kilburn Ave., Chicago, Ill.* Two air-operated arbor presses, feature pushbutton-controlled electric valves. Model M-1 is equipped with a 4½-in. dia. air cylinder with a 4-in. stroke and develops to 1270-lb. ram pressure with 80-lb. air-line pressure. Model M-2 has a 6½-in. dia. air cylinder and a 6-in. stroke and is capable of delivering ram pressures to 2650 lb.



STRAIGHTENING PRESS—*Colonial Broach Co., P.O. Box 37, Harper Station, Detroit, Mich.* 75-ton hydraulic straightening press, designed for handling both finished and rough work, employs a double-rail straightening fixture to take care of the larger and heavier work. Stroke of ram is 12 in.

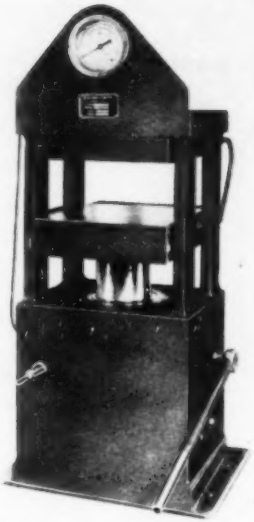


PRESS—*Watson-Stillman Co., Roselle, N. J.* Production demounting press is capable of handling all types of wheel sets without the use of spacers. The double-end machines, with 54-in. clearance between bars and a stroke at each end of 26 in., are available in 400- and 600-ton sizes.

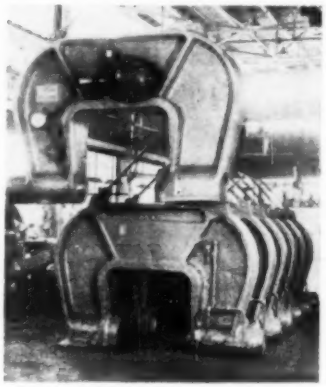
HYDRAULIC PRESSES — *Munton Mfg. Co., 9400 Belmont Ave., Franklin Park, Ill.* A line of motorized hydraulic presses with capacities of 3, 5, 7, 10 and 25 tons, can be used for straightening, forming, and many similar operations. Pressure is pushbutton controlled. Units are available in either gap or 4-post type.

WELDING PRESS—*E. W. Bliss Co., 450 Amsterdam Ave., Detroit 2, Mich.* Welding press is for high-speed assembly of a large metal section. Complicated assemblies can be performed automatically in one step. Bed size (clear die space) is 72x38 in. on the 4L and 69x29 in. on the 4 LU. Stroke on 4L varies from 12 to 16 in., on 4 LU, is set at 14 in.

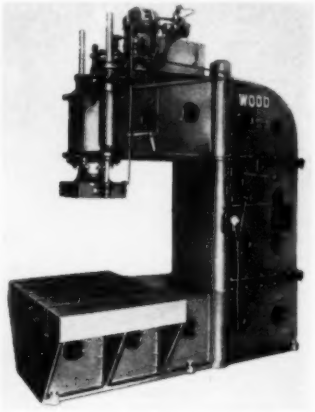
PORTABLE PRESS — *Watson-Stillman Co., Roselle, N. J.* Portable hydraulic press has a 200-metric-ton capacity. Capacity of the machine is adjustable by means of a padlocked, bypass safety valve from a maximum of 20 metric tons.



HOT-PLATE PRESS—*M & N Machine Tool Works, Inc., 152 Orono St., Clifton, N. J.* A 30-ton hot-plate hydraulic press is for plastic laminating, plastics and rubber molding, powdered metal, forming, drawing, embossing

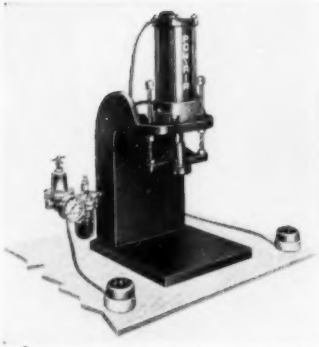


DIE-SHEARING PRESS—*M & N Machine Tool Works, Inc., Clifton, N. J.* Die-shearing press is for blanking, forming and embossing dies. The hardened punch or male die is machined, after which the female die is roughly sawed out. Die-shearing press is then used to shear in male punch by insertion into female part.

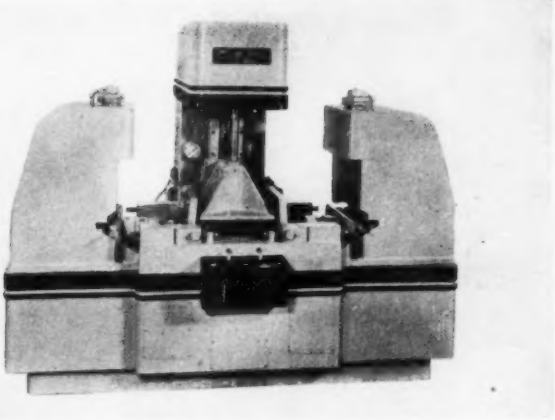


OPEN-GAP PRESS—*The R. D. Wood Co., c/o Harris D. McKinley Organization, 12 South 12th St., Philadelphia 7, Pa.* Open-gap press, the HydroLectric 250-ton open-gap type is a self-contained press, used in flanging, bending or straightening operations.

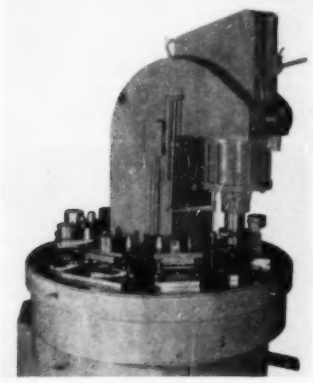
DIE-HOBBING PRESS—*E. W. Bliss Co., Detroit, Mich.* Die-hobbing press is rated at 500-tons pressure at a pressing speed of 2 ipm. Press is used for making reproductions of certain dies for use in multiple-stamping operations. Press is self-contained. The slide has a stroke of 6 in. Maximum vertical opening is 10 in.; minimum, 4 in.



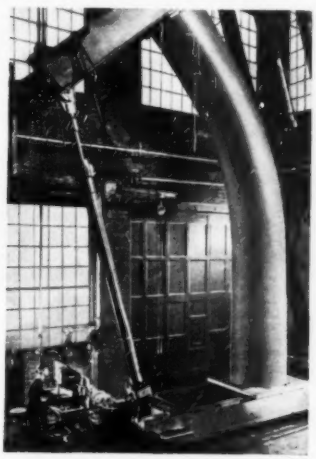
PRESS—*James Industries, Inc., 330 Municipal Bldg., Skaneateles, N. Y.* Portable pneumatic press is designed to release large presses on light forming, stamping, punching and similar operations. Capacity is to 1300 lb. Speeds are to 60 strokes per min.



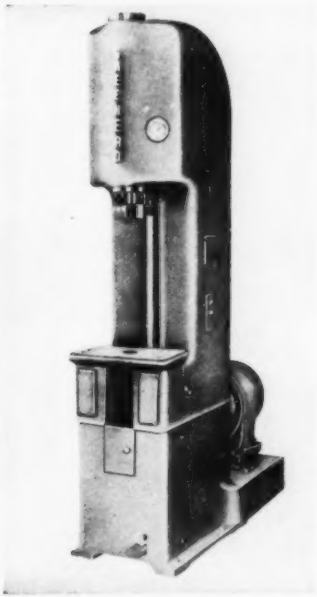
FORMING—*Cyril Bath Co., 6910 Machinery Ave., Cleveland, Ohio.* Three forming units make three separate bends to shape complete tub sides and backs of dish-washing machines in a cabinet-forming machine. Two outside heads contain forming slides which automatically form the curl and the reverse lip on extreme ends of part.



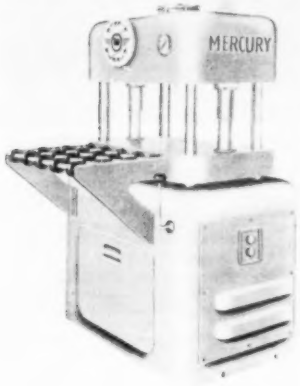
TURRET PRESS—*Rettig Engineering Co., distributed through the Universal Air-Line-Joint Mfg. Co., Lafayette, Ind.* Hydraulic turret presses are built in three sizes, 10, 20, and 30 tons, and can be operated either automatically or manually. Turret table has a 50-in. O.D. and 20-in. I.D.



BENDING MACHINE—*M. W. Kellogg Co., Jersey City, N. J.* Pipe-bending machine capable of bending a pipe large enough to garage a limousine handles pipe diameters to 100 in. The method bends pipe in the hot state under hydraulic pressure.



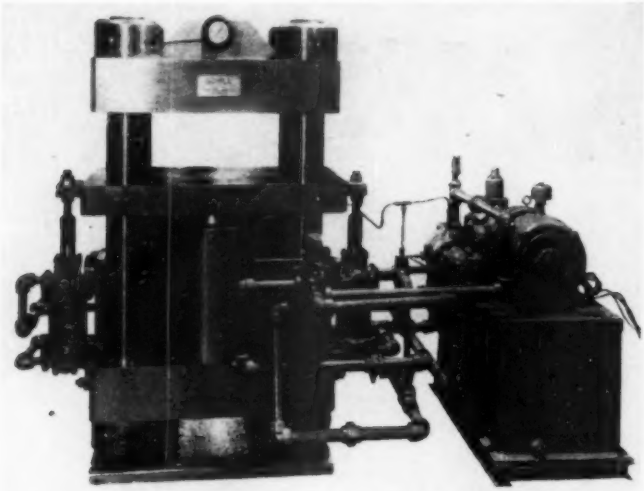
GAP-TYPE PRESSES — *Greenerd Arbor Press Co., Nashua, N. H.* G4, G6, and G8 gap-type hydraulic presses, have box-type construction and are cast of Meehanite metal. Presses receive diameters to 14 in. Pressures range from ¾ to 4 tons on the G4, ¾ to 6 tons on the G6, and ¾ to 8 tons on the G8 model. Fittings for broaching are available.



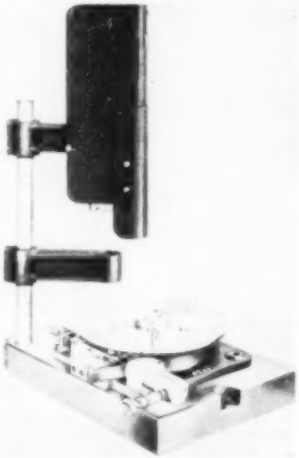
PRESS—*Elmes Engineering Works, Chicago 7, Ill.* Hydraulic tube-bending press having an unusually large number of bending combinations allows any number of sequences up to the maximum of twelve, with adjustable bending depth and automatic reset together with a choice of four bending radii. Press capacity is 20 tons.

HYDRAULIC PRESS—*Mercury Engineering Corp., 2100 North Farwell Ave., Milwaukee, Wis.* Hydraulic press known as the Mercury Series HD has a traveling lower platen moving vertically under hydraulic pressure. Model ← HD-25 is rated at 25 tons.

PRESS — *Winter Products, Inc., 189 State St., Bridgeport 3, Conn.* Spring air press is designed to cover entire range of foot- or kick-press operations. Machine features adjustable strength of blow. Standard spring is rated at 200 psi. of compression. Maximum blow is approximately 6400 lb. through a working distance of 1/16 in. at bottom of stroke.

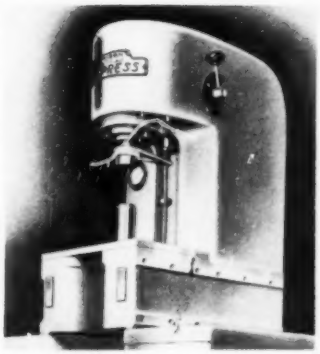


DIE-HOBBING PRESS — *Edward Franklin Schill Corp., 39 Cortlandt St., New York 7, N. Y.* All-steel 400-ton hydraulic die-hobbing press is a 4-rod press; has an up-moving ram with stroke of 6½ in., and daylight opening of 12 in. Stroke control is from ¾ in. to full stroke of 6½ in. Press is manually operated. Free closing speed is 75 ipm. while opening speed is 150 ipm.

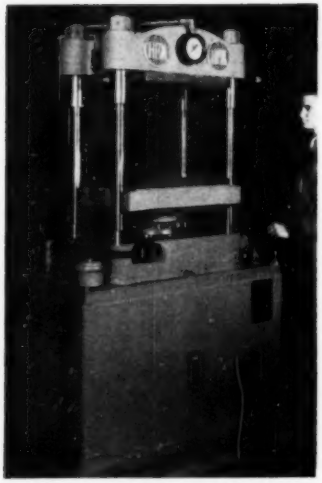


IMPACT HAMMER, AIR PRESS — *Mead Specialties Co., Dept. HP-4, 4114 N. Knox Ave., Chicago 41, Ill.* Air press and rotary work feeder with a universal base are offered. Press with various accessories can be used for light staking, forming, pressing, and assembly operations. Impact hammer and rotary feeder with universal base, illustrated, is capable of cycles up to 5000 per hr.

PRESS—*Preco Inc., 1102 Architects Bldg., Los Angeles 13, Calif.* Bench-type hydraulic press, the PA7 Preco is made for operations that require pressure to 20 tons and that may also require heat. Platen sizes of 8x8, or 8¾ x 12 in. are available.



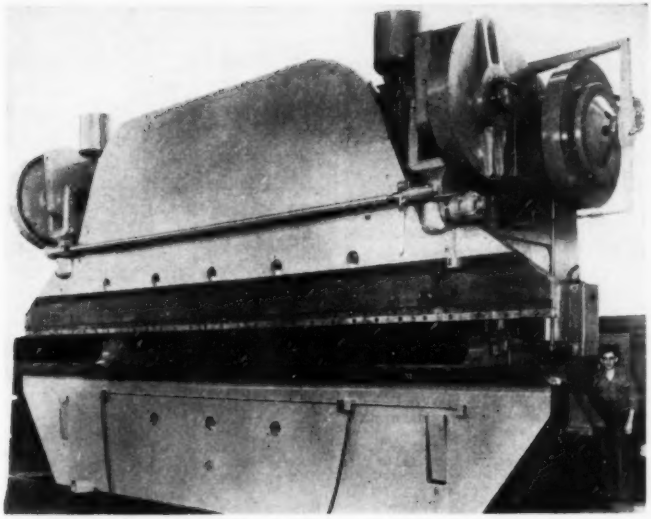
MULTIPRESS — *The Denison Engineering Co., 1160 Dublin Rd., Columbus 16, Ohio.* Rocket Multipress offers speeds of 1100-ipm. approach speed, 450-ipm. pressing speed and 750-ipm. return speed. Three major design changes include one in control system, one in operating component, and one in power system.



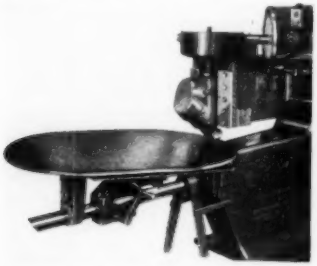
PRESS—*Hydraulic Press Manufacturing Co., Mount Gilead, Ohio.* Upward-acting hot-plate 5-ton press for laboratory or small-production pressure processing where heat is required, has self-contained hydraulic power unit. Adaptable to steam or electrical heating, machine has two 20x20x1⅛-in. hot plates for handling laminating and curing work.

PRESS—*Hydraulic Press Mfg. Co., Mount Gilead, Ohio.* Hydraulic laboratory press with a 20-ton capacity is designed with double-acting ram for providing positive pullback pressure for separating molds and dies. Pressing surfaces are 8x9 in. Maximum opening is 14 in., max. travel, 8 in., and max. pullback pressure is 2½ tons.

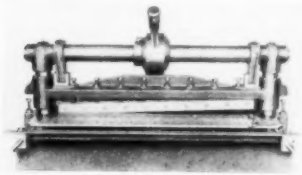
PORTABLE PRESS—*Studebaker Machine Co., 1221 S. 9th Ave., Maywood, Ill.* Hand-operated portable hydraulic press is for laboratory or production work. Electrically heated platens are offered as optional equipment. Operation of the hand lever produces to ←8-ton pressure between platens.



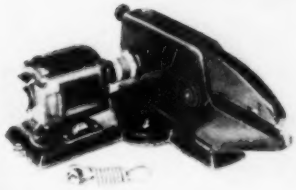
PRESS BRAKE—*Cincinnati Shaper Co., Cincinnati, Ohio.* Two-housing mechanical press brake has a clear span between housings at 21½ ft., and an over-all die surface of 30 ft. Housing plates are 16½x15½ ft. and 8 in. thick, and weigh 53,000 lb. each. Machine is capable of bending 30 ft. of ¾-in. plate over an 8-in. die opening and heavier plate of shorter lengths.



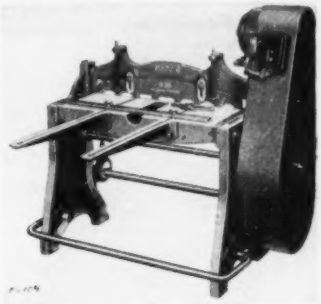
AUTOMATIC MACHINE—*Kling Bros. Engineering Works, 1320 N. Kostner Ave., Chicago 51, Ill.* Automatic shear, flanger, and former, using rotary or circle shears will shear, flange, and form sheets or plates in many odd and irregular shapes, and eliminates hand-guiding methods. Operation is guided automatically.



SHEAR—*O'Neil-Irwin Mfg. Co., Lake City, Minn.* Di-acro shear, No. 4, a Dieless Duplicating unit shears a wide variety of materials to close tolerances. Maximum shearing width is 24 in. Maximum material capacity is 16-gage sheet steel (0.062 in.).

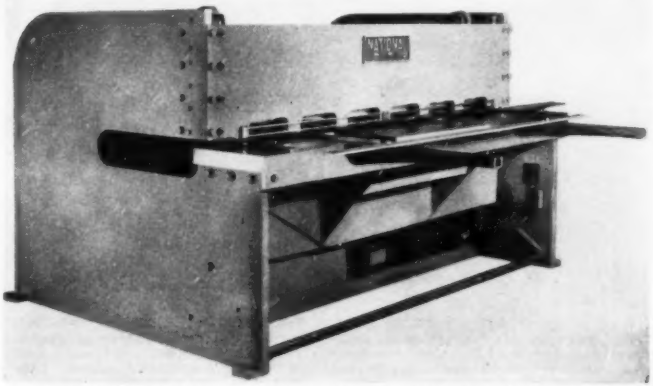


SMALL-HEAD SHEAR—*Federal Machinery Co., 134 Grand St., New York, N. Y.* High-speed shear called the "Grampus," is designed with a small head and base to permit wide variation in work shape. Odd-shaped material can be placed over the head or under the base for burr-free cutting. Machine is rated to 14-gage mild steel.

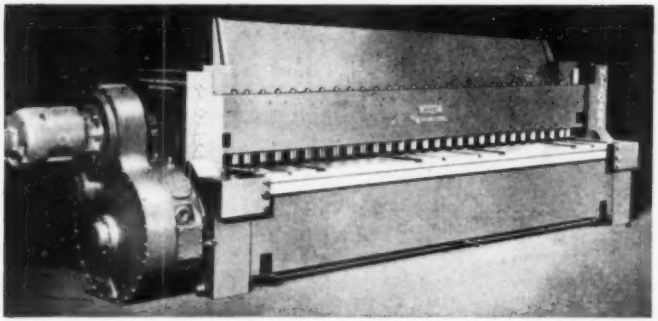


POWER SHEARS—*Framco Machine Co., Racine, Wis.* Line of lightweight power squaring shears will handle 18-gage stock. High-carbon tool-steel blades are included. The shears have a single-stroke mechanism that can be set for continuous operation.

NOTCHER—*O'Neil-Irwin Mfg. Co., 311 Eighth Ave., Lake City, Minn.* Di-Acro notcher, a flexible precision shearing unit cuts notches in sheet materials and is said to eliminate necessity of dies. Notches of 90°, as well as smaller or greater angles, can be cut in any size within capacity of machine.

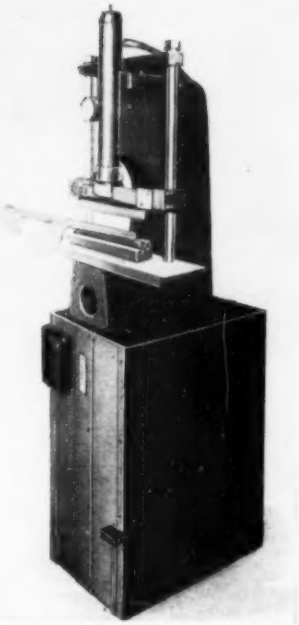


SQUARING, GAP SHEARS—*National Machinery & Equipment Co., Seminary Road and Columbia Pike, Fairfax County, Virginia.* A 3/16-in. x 6-ft. gap shear has a 24-in. gap in the end frame. Both 3/16- and ¼-in. capacities in 6-, 8-, 10-, and 12-ft. lengths are available in squaring and gap models. The four cutting-edge knives are of a high-carbon-chrome alloy.

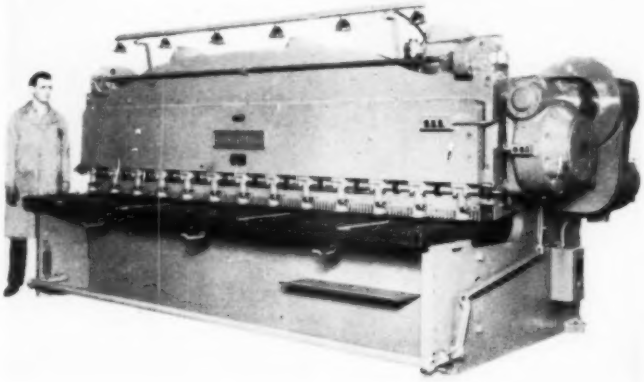


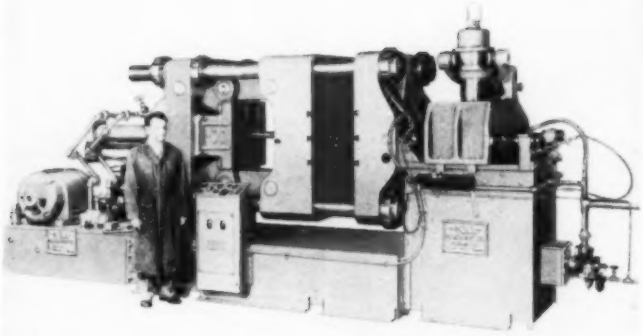
SHEAR — *Niagara Machine & Tool Works, Buffalo 11, N. Y.* Heavy-duty underneath-drive squaring shear has a $\frac{5}{8}$-in. capacity in mild steel. It is 14 ft. long, and is called No. 1214. The holddown, driven by eccentrics on the crankshaft, need no auxiliary operating mechanism.

ALL-STEEL SHEAR—*The Cincinnati Shaper Co., Cincinnati, Ohio.* All-steel shear has a capacity of $\frac{1}{4}$ in. in mild steel 12 ft. long. A very low rake or shear angle to the upper knife is featured on this shear. The low rake insures the sheared strips with a minimum of twist, bow or camber. ↓



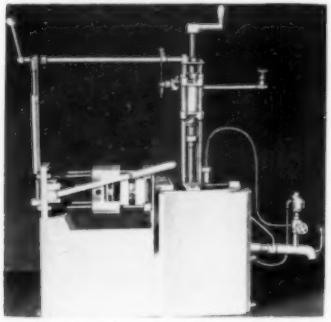
HYDRAULIC PRESS BRAKE—*The Munton Mfg. Co., 9400 W. Belmont Ave., Franklin Park, Ill.* Hydraulic press brake can handle 90° bends in mild steel. The 10-ton model handles 18-gage stock 3 ft. long, 14-gage stock 2 ft. long, and 10-gage stock 1 ft. long. The 20-ton unit handles 12-gage 3 ft. long, and the 30-ton, 10-gage 3 ft. long.





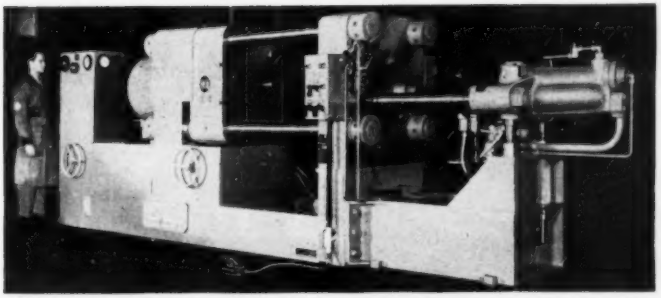
DIE-CASTING MACHINE—*Kux Machine Co., 3940 West Harrison St., Chicago, Ill.* Standard die-casting machine, in three varied models, has an 800-ton locking pressure and will form castings in zinc weighing to 30 lb., and in aluminum weighing to 10 lb. High injection pressures are utilized, reaching as much as 40,000 psi.

PRESS BRAKES—*Knight Machinery Co., 1001 S. Delaware St., Indianapolis, Ind.* Three all-steel welded press brakes feature micrometer dials for out-of-parallel adjustment of ram, and infinitely variable speed adjustment. Machines are available in 24-in. by 18 gage, 36-in. by 18 gage, and 48-in. by 18 gage capacities.



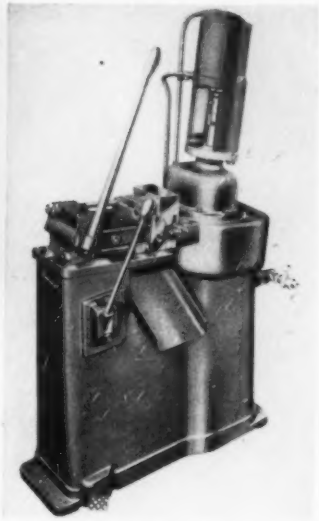
DIE-CASTING MACHINE — *H. L. Harvill Mfg. Co., Corona, Calif.* Small semi-air die-casting machine known as Model AHH-1, is a small-production model which injects the metal by air pressure through an immersed injection-piston assembly. Machine casts zinc, lead and tin base alloys through a center gate. Normal die dimensions are 6x10 in.

DIE-CASTING MACHINE — *Light Metal Machinery, Inc., 736 Penton Bldg., Cleveland, Ohio.* Hydraulic model of the Workhorse automatic die-casting machine listed as No. 32 HZ, is designed for zinc, tin, or lead production. Shot capacity is 32 oz. Top speed is 720 shots per hr. Casting cycle is automatic.

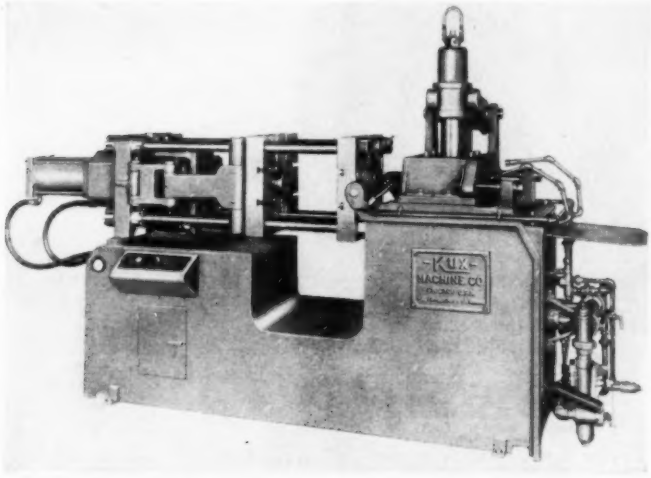


COLD-CHAMBER MACHINE — *Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.* Cold chamber machine is for the production of die castings of aluminum, magnesium and copper-base alloys. Porosity is minimized by sustaining high injection pressures. Aluminum castings weighing up to 10 lb. can be mass produced.

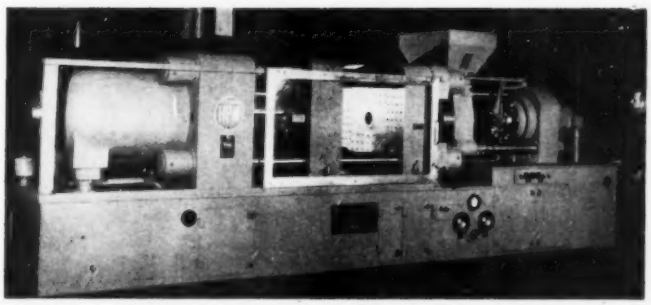
DIE-CASTING MACHINE — *Kux Machine Co., 3924 W. Harrison St., Chicago 24, Ill.* Push-button control accomplishes a complete die-casting cycle, with each phase electrically timed, on the Model BA-12 air-operated die-casting machine. Die space is 12x12 in. between bars. Castings to 5 lb. in zinc including gate can be made.



DIE-CASTING MACHINE — *DCMT Sales Corp., 315 Broadway, New York, N. Y.* Small die-casting machine, listed as model M55A/HF, is air-operated and designed for economical casting of small parts in zinc alloy, utilizing single-cavity dies operating at high speed.

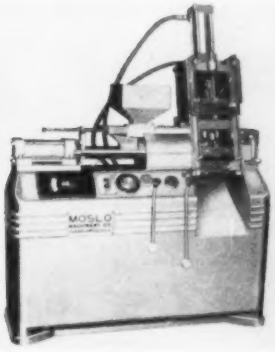


INJECTION PRESSURE MULTIPLIER—*Kux Machine Co., 3932 W. Harrison St., Chicago 24, Ill.* Injection pressure multiplier multiplies metal injection pressure during final travel of the plunger's stroke and is said to increase the ending pressure from twice to five times that of starting pressure.

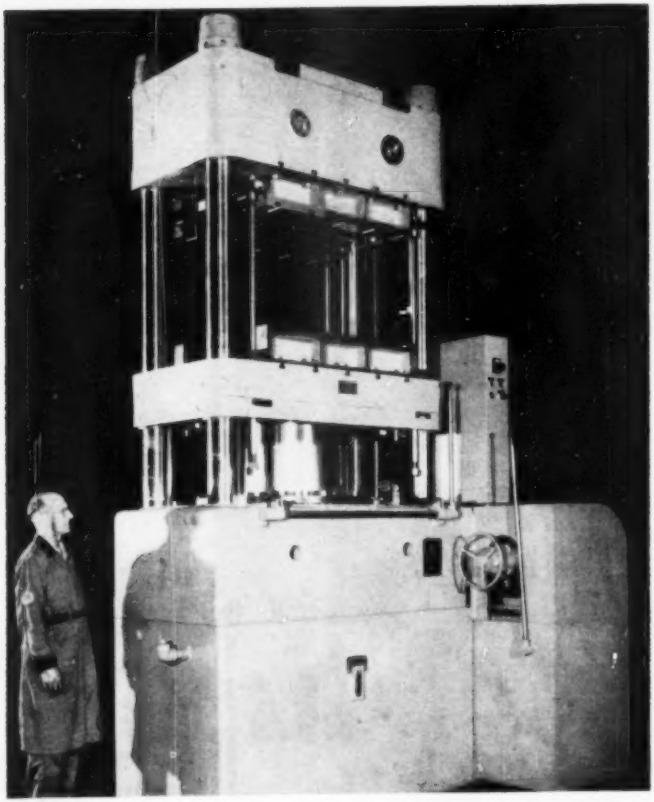


MOLDING MACHINE — *The Hydraulic Press Mfg. Co., Mount Gilead, Ohio.* Thermoplastic molding machine, capable of molding 40 oz. of acetate or 32 oz. of polystyrene per cycle is single-nozzle injection-type machine. Machine is automatic except for the removal of molded parts after ejection from mold. Maximum mold space is 51x25 in. or 30x47¾ in.

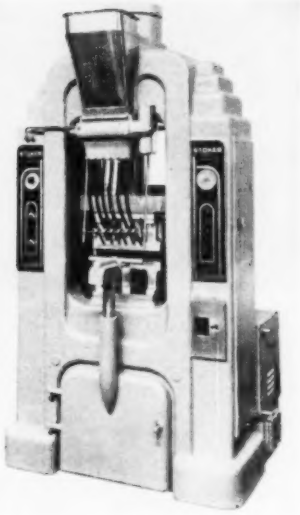
DIE-CASTING MACHINES — *DCMT Sales Corp., Beach 79th St. at Bay, Rockaway Beach, N.Y.* Die-Casting machine for both zinc and aluminum called the Two-Pounder can cast aluminum as rapidly as zinc. Production rate for each metal is about 350 shots per hr. Capacity is 2 lb. on zinc and 1 lb. on aluminum, on 12x18-in. standard die blocks.



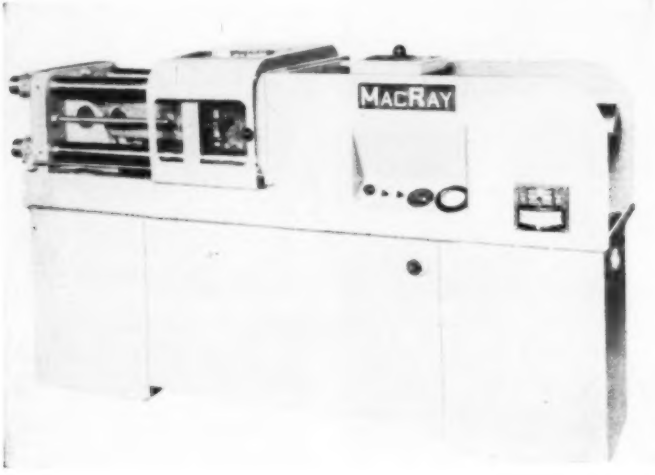
PLASTICS INJECTION PRESS—*Moslo Machinery Co., 2443 Prospect Ave., Cleveland 15, Ohio.* Universal all-hydraulic Minijector plastic injection molding machine is arranged for manual operation as well as semi-automatic operation. It can be furnished for the molding of nylon or vinyl as well as the complete range of thermoplastic materials.



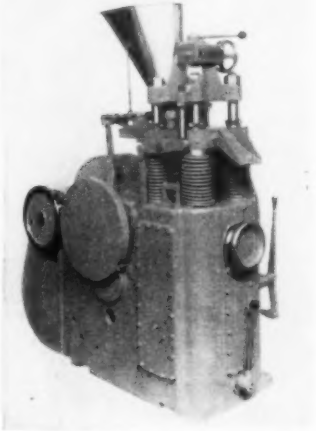
PLASTICS MOLDING PRESS—*Hydraulic Press Mfg. Co., Mount Gilead, Ohio.* Plastics molding press has a pressure capacity of 500 tons. The large-compression semi-automatic press has a maximum mold size of 42x36 in. The daylight between platen and head is 54 in.



PLASTICS-MOLDING PRESS—*F. J. Stokes Machine Co., 6120 Tabor Road, Philadelphia, Pa.* One-piece frame No. 235-A automatic plastics-molding press offers an improved slow-close automatic control. The 50-ton hydraulic press includes a self-contained power unit.

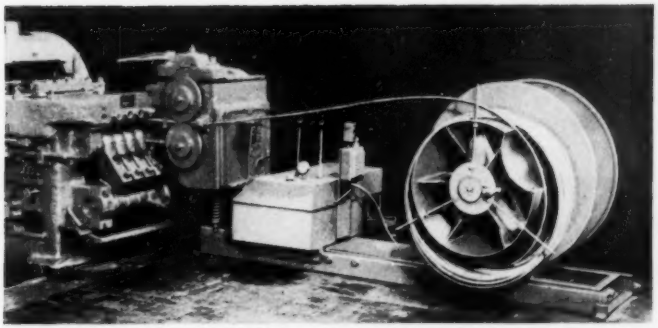


INJECTION MOLDING MACHINE—*MacRay Engineering Co., Cleveland 3, Ohio.* Machine is rated at 3-oz. capacity. The bed is not a stress member since the rated 75-ton clamping pressure is taken in the four, 3-in.-dia. strain rods. Molds 12x15 in. with a 12-in. max. thickness can be set up.



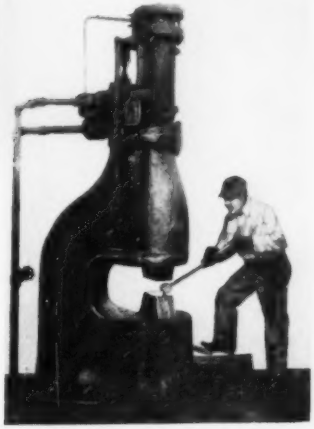
PREFORMER—*F. J. Stokes Machine Co., 5900 Tabor Road, Philadelphia, Pa.* Model 294 dual-pressure preformer is offered. Pressure is applied, using a floating die table, from both top and bottom simultaneously.

INJECTION MOLDING MACHINES—*Watson Stillman Company, Roselle, N. J.* Improved heating cylinder for thermoplastics molding is now standard equipment on all W-S Completeline injection-molding machines from 4- to 80-oz. capacity. The design allows capacity shots of such derating materials as polystyrene without stuffing.

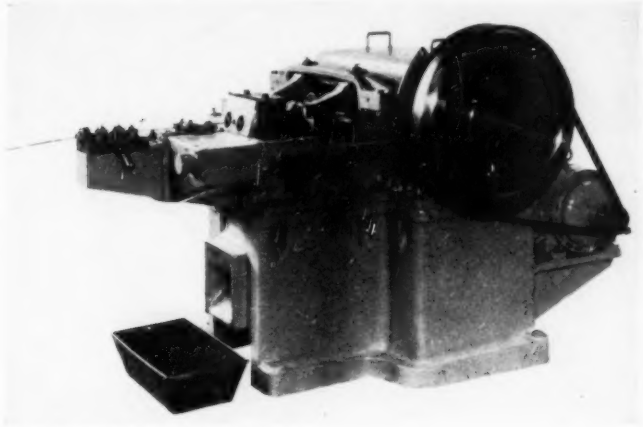


STRAIGHTENING DEVICE—*National Machinery Co., Tiffin, Ohio.* Hydraulic straightening device for use on cold-heading equipment using heavy wire, or coiled hot rods, is said to reduce downtime caused when feeding a new coil of wire into a machine by mechanically straightening a length long enough to pass through the feed tube and rolls, and by supplying power to push the straightened length into the machine.

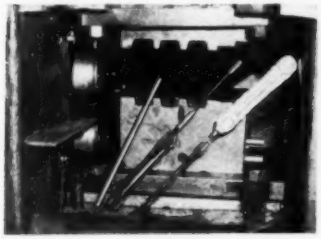
COLD-NUT FORMER—*The National Machinery Co., Tiffin, Ohio.* Cold-nut formers produce hexagonal nut blanks. Nut types produced include standard single- and double-chamfered nuts, washer-faced nuts, castellated nuts, hug lock nuts, Marsden lock nuts, and jam nuts.



HAMMERS—*Chambersburg Engineering Co., Chambersburg, Pa.* General utility hammer is made in a range of sizes from 50- to 500-lb. falling weight. An automatically lubricated power-saving cylinder is offered.

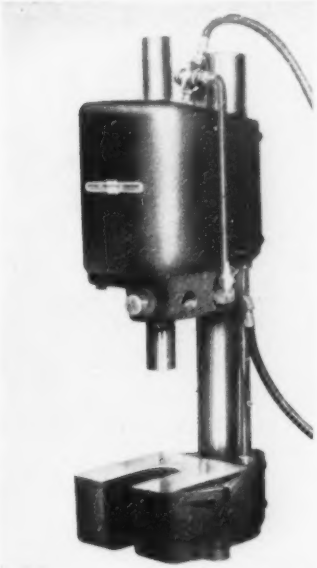


NAIL-MAKING MACHINE—*Black Industries, 1400 East 22nd St., Cleveland, Ohio.* Nail-making machine is capable of producing 430 8-penny nails per min. The machine is of all-steel construction and weighs 4500 lb. It is inclosed and operated under pressure lubrication. Nine different models will be available to turn out from the smallest brads to spikes.



FORGING TECHNIQUE—*The National Machinery Co., Tiffin, Ohio.* The Maxirolling forging technique distributes stock to meet requirements of the final forging. A Maxipress prepares blanks with accurately reduced sections. The Maxiroll, the auxiliary attachment which does the preforming, consists of a pair of reducing rolls mounted in a side window of the press.

REDUCEROLL—*The National Machinery Co, Tiffin, Ohio.* Reduceroll is designed to reduce or preform forging blanks by rolling, to accurately distribute the stock to meet the requirements of the final forging. The machine can be used with hammers or forging presses.

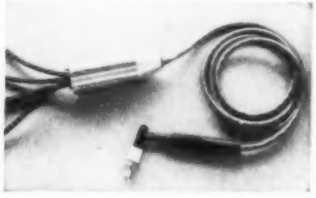


AIR IMPACT HAMMER—*Bryant Products Distributing Co., 297 W. Michigan Ave., Jackson, Mich.* An air-impact hammer offers "exploded air" said to make possible the production of 1-oz. to 12,000-lb. impact with 100-lb. line pressure. Bench-type production hammer is used for light stamping, forging, trimming, molding, riveting and forming various materials.

Welding and Heat-treating

AMERICAN MACHINIST 36th ANNUAL REVIEW

SHAPE-WELDING MACHINE — *The Linde Air Products Co., Unit of Union Carbide and Carbon Corp., 30 East 42nd St., New York 17, N. Y.* Machine makes welds to any outline by its submerged-melt welding process. Any desired outline can be followed by the use of a strip templet. It can weld in a single pass material from 18-gage to 1½-in. plate.



HOLDER—*Air Reduction Sales Co., 60 E. 42nd St., New York 17, N.Y.* Water-cooled manual Heliweld holder for continuous-production work with the inert-gas-shielded arc-welded method, features an insulated all-plastic exterior and a gas cap. Capacity is 300 amp. ac. or dc.

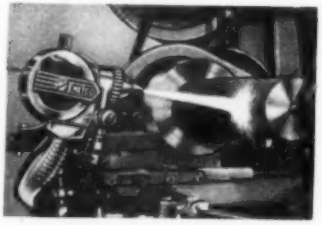
TORCH—*Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.* Carbon-arc torch is for brazing, soldering and supplying heat for light forgings, and other operations. Torch is supplied with two 10-ft. welding-cable leads attached, one pair 14x6-in. electrodes, and one pair ⅜x6-in. carbon electrodes.

CUTTING ATTACHMENT — *Wall Chemicals Div., Liquid Carbonic Corp., 3100 S. Kedzie Ave., Chicago 23, Ill.* Attachment for the Gasweld AV-10 lightweight welding torch enables use of torch as a precision tool for light cutting jobs. Tips for the WC-10 cutting attachment are furnished in sizes 0, 1, and 2.

TORCH—*Sully Engineering Ltd., 7416 Melrose Ave., Los Angeles, Calif.* Crown torch, designed for all soldering, brazing, and heat operations, is self-contained and burns butane or propane gas. Torch is 12 in. long, weighs 2½ lb. when full, and has no large tanks or hoses.

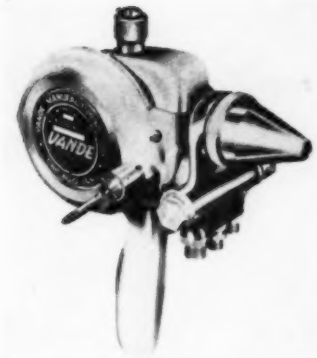
EXTENSION BAR — *Scientific Research Co., Box 19, 1618 N. Vancouver Ave., Portland 12, Oregon.* Radius-extension bar made for the Flash Circle burner, is made of rigid cold-rolled steel with the adapter permanently fixed to the bar by induction silver soldering. It can be used to cut circles to 60 in. in dia.

FLAME MACHINING PROCESS — *The Cogmatic Co., Milwakee, Wis.* Flame machining process is for cast-iron or cast-steel sprockets and gears. Sprockets are said to be flame machined from steel plate in as little as 5 min. for a 12-in. sprocket. Present model will handle sprockets and gears with diameters to 4 ft.



METALLIZING GUN—*Metallizing Engineering Co., Inc., Long Island City 1, N.Y.* Light-duty low-air "L" gun requires 10 cfm. of air for metallizing. Turbine construction offers low power requirement, making a large compressor unnecessary.

TORCH — *Weldit, Inc., 990 Oakman Blvd., Detroit 6, Mich.* Welding and heating torches, Models 160 and 160-G, are a three-hose torch, using two tanks of acetylene and one of oxygen. Torch is said to be of particular advantage in welding, heating or brazing broken parts on heavy machinery.



METALLIZING GUN—*Vande Mfg. Co., 1837 S. Michigan Ave., Chicago 16, Ill.* Metallizing gun for application of steel, aluminum, zinc, lead, bronze and other metals, has nozzle for mixing gas and oxygen at point of combustion.

TORCH—*Air Reduction Sales Co., 60 E. 42nd St., New York 17, N.Y.* Hand torch for cutting stainless steel using Airco's flux-injection process, called Style 9016, is available in 21- and 36-in. lengths. Both lengths come with a 90° torch head. A remote-control cut-off automatically coordinates flux feed with cutting oxygen.

WELDING TORCH—*Wall Chemicals Div., The Liquid Carbonic Corp., 3100 S. Kedzie Ave., Chicago 23, Ill.* Automatic welding torch the WA-54, has lever-operated built-in gas saver for production work in the rapid welding of small assemblies. When laid aside, torch goes out except for a small acetylene pilot flame.

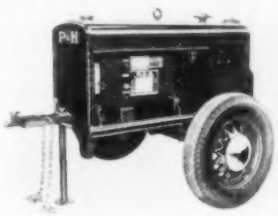
WELDING TORCH—*Air Reduction Sales Co., 60 E. 42nd St., New York, N.Y.* Oxyacetylene welding torch, the Airco 80G, is 11½ in. long, and has a capacity for operating single-flame welding tips from No. 0 to 13 as well as multiflame tips up to No. 15.

TORCH HEAD—*The Hamilton Tool Co., 9th St., Hanover, Hamilton, Ohio.* Welding and cutting torch called Cristorch has a flexible head which can be revolved through an arc of 180°. The torch is said to cut metal of thicknesses from 1/32 to 4 in. It will cut holes and circles from ⅜- to 30-in. dia.

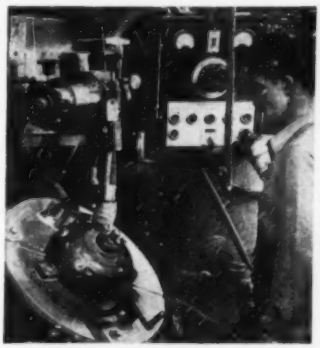
WELDING EQUIPMENT—*The Lincoln Electric Co., Cleveland 1, Ohio.* Manual Lincolnweld, for semi-automatic welding, provides the necessary welding current and auxiliary power plus automatic wire-feed mechanism and controls. Welder was designed for hidden-arc deep-flux welding employing high-current densities.

TORCH—*The Lincoln Electric Co., Cleveland 1, Ohio.* Carbon-arc torch for use with ac. welding machines is applicable where heat is desired without melting the metal being worked. Jaws will hold either a 5/16- or ⅜-in. dia. carbon without adapters.

WELDER—*The Linde Air Products Co., Unit of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N.Y.* Unionmelt is an automatic flexible welder, using a submerged-melt welding process useful for making welds that are inaccessible for automatic welding. Bare rod to 5/32-in. dia. can be used.



PORTABLE ARC WELDER—*Harnischfeger Corp., Welding Div., 4400 W. National Ave., Milwaukee 14, Wis.* P&H Model WN-200 is now featured with extra power supply offered as optional equipment. It permits use of electric lights and any universal ac.-dc. portable tool from this source.

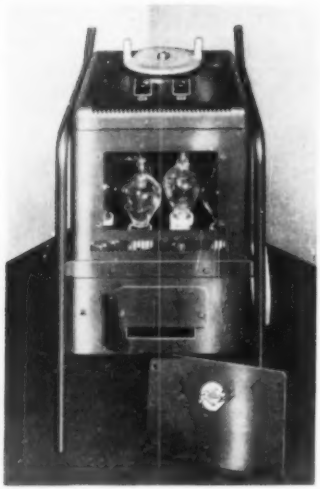


WELDER — *Westinghouse Electric Corp., Box 868, Pittsburgh 30, Pa.* Single unit, the Weldomatic, includes welding head, control equipment, welding transformer and work-positioning equipment. Standard head, suitable for welding ac. or dc. operates with capacity of 1200-amp. ac. Wire-feed rolls accommodate ⅛-, 5/32-, 3/16-, and ¼-in. wire.

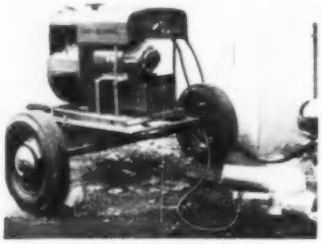
PORTABLE WELDER—*The Lincoln Electric Co., Cleveland, Ohio.* Portable welder is the gasoline-engine-driven type. The lightweight 180-amp. welder, known as the Lincwelder, is approximately 2x2x4 ft. The current range is from 20 to 180 amp.

WELDERS—*Glenn-Roberts Co. Inc., 2107 Adams St., Indianapolis 18, Ind.* Ac. welders have rating from 100 to 2000 amp. Four utility models are NEMA-rated at 100, 150 and 200 amp. at 30 volts, 50% duty cycle.

WELDERS — *Mid-States Equipment Corp., 2429 S. Michigan Ave., Chicago 16, Ill.* Two hi-cycle ac. arc welders for heavy-duty industrial use are models with 200- and 300-amp. output, respectively, featuring a precision electrical circuit which holds the welding arc constant with selective heat settings ←in 1-amp. steps.



ARC WELDERS—*John A. Kern Co., 224 N. Loomis St., Chicago 7, Ill.* Duel-Tronic combination dc.-ac. welder is offered in two models, No. 30 DA, and Model 25 DA. The former has a dc. range of 5 to 60 amp., and an ac. range of 25 to 200 amp. The Model 25 DA has a dc. range of 5 to 90 amp., and an ac. range of 25 to 200 amp.



WELDER—*General Electric's Welding Equipment Div., Schenectady 5, N. Y.* Lightweight, engine-driven dc. welder weighs 660 lb. for a maximum of 250 amp. of welding current. It can be transported on a pick-up truck, leaving truck capacity for other equipment.

WELDERS — *Foster Mfg. Co., One Kinsey Ave., Buffalo 17, N. Y.* Eight welding units are recommended for automotive and general industrial maintenance, repair and production welding. Prices range from $39.50 to $225. list, complete with accessories and helmets.

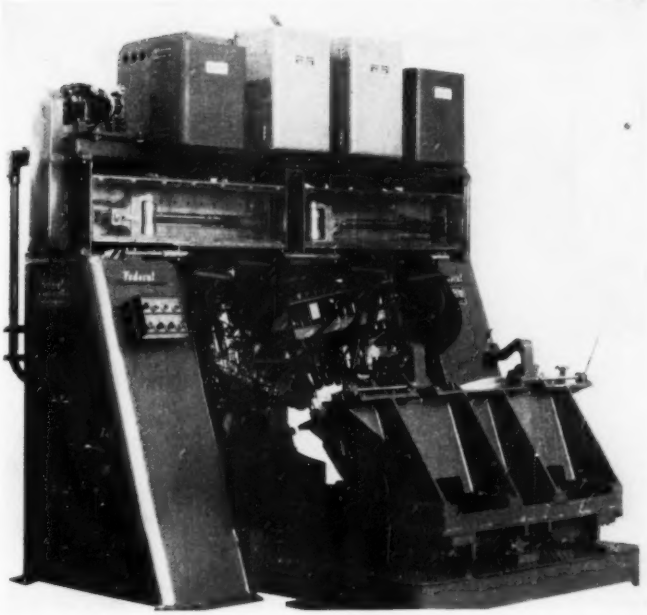
WELDER—*Electric Arc, Inc., 152-162 Jelliff Ave., Newark, N. J.* Arc portable welder, redesigned with no moving parts, is built for general-purpose use and is a plug-in type with multiple-stage heat ranges.

AC. WELDER—*National Cylinder Gas Co., 840 N. Michigan Ave., Chicago 11, Ill.* Sureweld welder is available in 12 models; seven for high-speed heavy-duty fabrication, and five for machine shops, welding shops, and light-production work.

WELDING UNIT—*Tri-Arc Corp., 6859 S. Anthony Ave., Chicago 37, Ill.* High-frequency unit for electric welders known as the Pilot-Arc, attaches to ac. or dc. welders and is said to provide an automatic arc, eliminating the scratching method. Standard model operates on from 0 to 300 amp. ac., 50-60 cycles, single phase.

ARC WELDERS—*Metal & Thermit Corp., 12 Broadway, New York 5, N. Y.* Arc welders are offered for ac. and dc. arc-welding applications. The ac. unit features include built-in power-factor corrector, stepless current control, and a wide current range. They are the transformer type available in 150-, 200-, 300-, 400-, and 500-amp. capacities.

ARC WELDERS—*John A. Kern Co., 2239 N. Loomis St., Chicago 7, Ill.* Line of ac. arc welders offers three industrial models, 200, 300, and 400 amp. Two models for farm and general shop use, 130 and 180 amp., are included. All models have high power factors therefore reducing "no-load" losses.



SPOTWELDER — *The Federal Machine and Welder Co., Warren, Ohio.* Multiple-spotwelder for welding automobile dash panels utilizes two ultra-speed units, two water-cooled transformers and 76 hydraulically operated welding guns. Production is said to be 80 parts per hr.

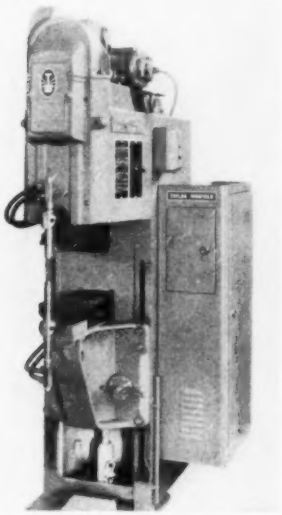
WELDERS—*Trindl Products, Ltd., 17 East 23rd St., Chicago 16, Ill.* Improved, general-purpose, limited-input transformer-type welders for use on single-phase, rural and other limited-capacity power lines, conform with both REA and NEMA specifications. Machines are available with and without power-factor correction in output ratings of 130 and 180 amp.

STABILIZER—*Hobart Bros. Co., Troy, Ohio.* High-frequency stabilizer for inert-gas, shielded-tungsten-electrode welding is useful in sheet-metal work, low-current applications, vertical and overhead welding, and with twin carbon-arc torches. Two sizes offer capacities of 300 and 500 amp.

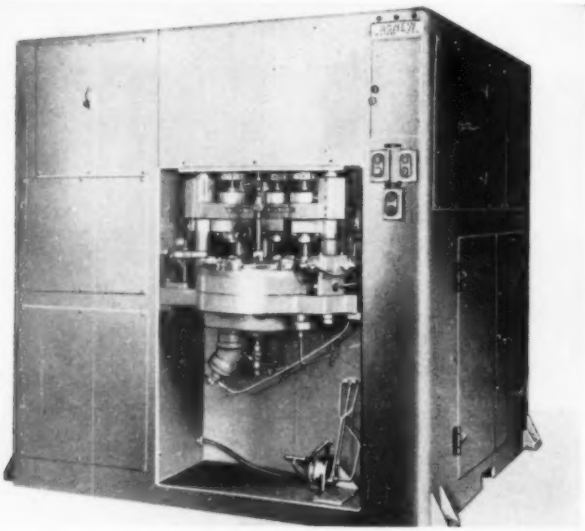
SPOTWELDER — *Greyhound A. C. Arc Welder Corp., 604 Johnson Ave., Brooklyn 6, N. Y.* Lightweight portable self-operating spot-welder weighs approximately 23 lb., and welds up to ⅛-in. combined thickness of metal. Copper arms are available in three lengths—6, 12, and 18 in.

SPOTWELDER—*Electric Arc Inc., Newark, N. J.* Heavy-duty unit features 8-step current control permitting 75% secondary-voltage adjustment. Equipment operates on 220-v., 60-cycle, single-phase ac.

SOLDERING-IRON ELEMENT — *Hexacon Electric Company, 135 W. Clay Ave., Roselle Park, N. J.* Electric soldering iron is used on fast production lines where greater speed is required from an iron with a small tip diameter. Iron is the plug-tip type, rated at 200 watts, 110 or 220 volts, ac. or dc., with a ½-in.-dia. tip.

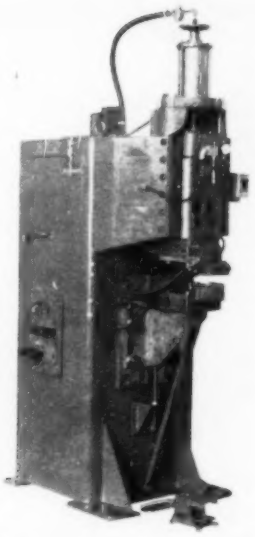


WELDER — *Taylor-Winfield Corp., Warren, Ohio.* The improved Type ENB motor-driven press-type spot and projection welder includes roller anti-friction head. Cam design is said to give higher speeds without hammering or defacing work. Up to 200 strokes per min. are possible.



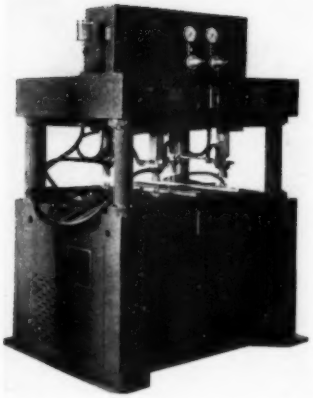
SPECIAL ASSEMBLING MACHINE—*Agnew Electric Co., Milford, Mich.* Assembling of one-piece spark plugs is done on this special hydraulic machine. Listed as type HCP3-5, machine can be adapted to progressive welding and forming operations. Table has six stations which index 60°.

SPOTWELDERS—*Sciaky Bros., Chicago 38, Ill.* Series of air-operated press-type welders, available with three-phase control, offers a choice of five power ratings, 20, 30, 40, 50, and 75 kva., and four throat depths, 12, 18, 24, and 30 in. Capacities on mild steel range from 0.016 to 0.125 in.

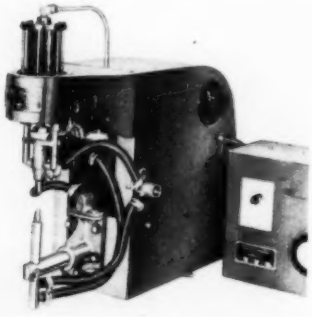


WELDER—*The Federal Machine and Welder Co., Warren, Ohio.* Projection welder welds lips of coffee pots at a rate of 4000 per 8-hr. day. One cycle of current is used to complete weld. The adjustable non-retractable stroke cylinder makes possible the use of various sizes and designs of dies for welding all types of kitchen utensils.

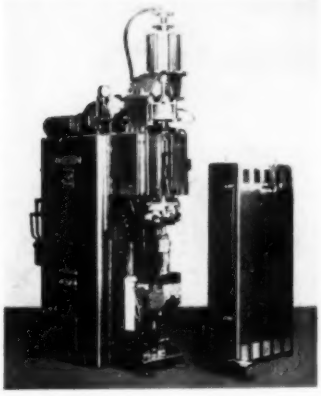
WELDING SYSTEM—*Thomson Electric Welder Co., 163 Pleasant Street, Lynn, Mass.* Balanced-load welding system converts three-phase power to single-phase low-frequency resistant-welding current. The standard Thomson spot projector, seam and flash welder, as well as special resistance welders are available with this balanced-load system. →

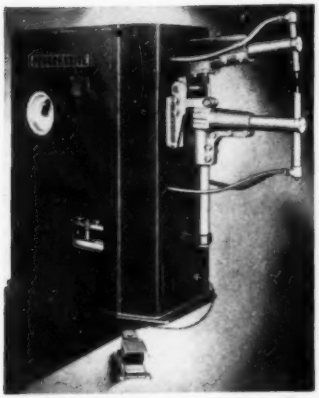


WELDER—*Sciaky Bros. Inc., Chicago, Ill.* Special multiple-projection welder is rated 100 kva. at 50% duty cycle, and is guaranteed to perform the welding of 4 clips simultaneously on 4 sizes of stove panels.

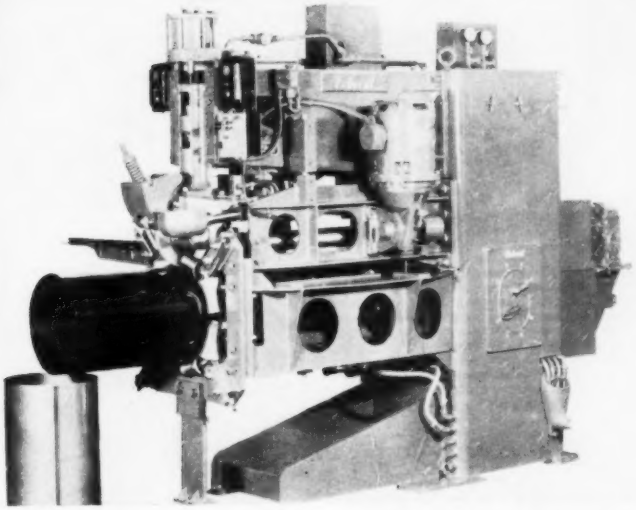


BENCH WELDER—*Welder, Inc., Detroit, Michigan.* Automatic 7½-kva. bench-type spot-welder for joining small metal parts (Model 752-PB) handles light non-ferrous metals of the same or dissimilar alloy and thickness on a high-speed production basis and ferrous metals up to two thicknesses of 14-gage cold-rolled steel.



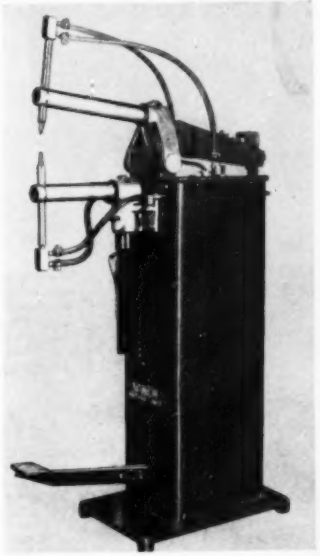


ROCKER-ARM WELDERS—*Progressive Welder Co., 3050 E. Outer Drive, Detroit 12, Mich.* Line of standard air-operated rocker-arm welders, in both 30- and 50-kva. capacities have throat depths ranging from 18 to 36 in. for each capacity. Three independent water-cooling circuits are used for transformer, lower arm, and upper arm.

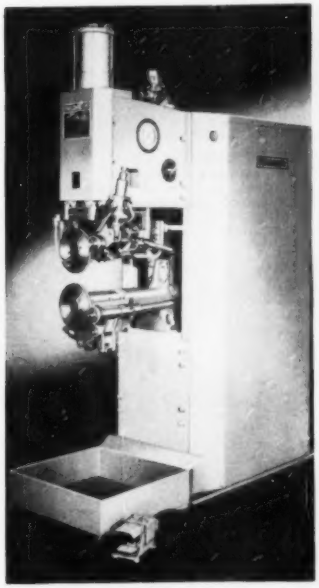


SEAM WELDER — *The Federal Machine and Welder Co., Ohio.* Automatic cylinder-forming seam welder will process 26- to 16-gage mild-steel cylinders ranging from 11¼ in. in diameter and 14 in. long to 22 in. in diameter, and 37½ in. long. Welder operates at production rates of 600 to 1500 per hr.

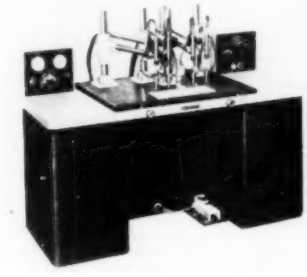
PROJECTION WELDER—*Acme Electric Welder Co., 2618 Fruitland Rd., Los Angeles 11, Calif.* A projection welder for speedy operation on light jobs, listed as Type PT-O, is an air-operated, press-type, direct-action projection-welding machine, supplied in either 20, 30 or 40 kva. Machine can be converted to a conventional spotwelder by use of horn adapter and horn.



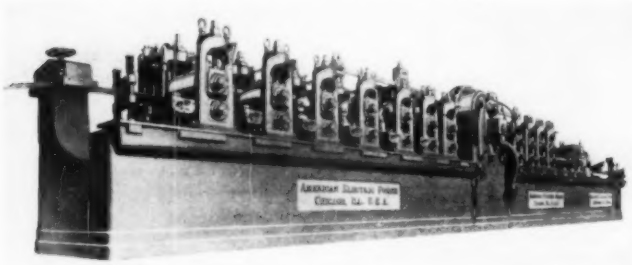
SPOTWELDER—*Agnew Electric Co., Milford, Mich.* Foot-operated pivot-type spot welder, Type J, is furnished in 12-, 18-, and 24-in. throat depths with 10-kva. transformer. Transformer has a short secondary circuit resulting in high efficiency.



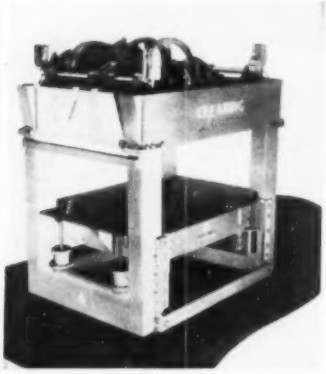
SEAM - WELDERS — *Progressive Welder Company, 3050 E. Outer Drive, Detroit 12, Mich.* Line of roller-head seam welders comprises light-, medium- and heavy-duty sizes. Each is available for circular welding, for longitudinal welding, or for both ("universal" models).



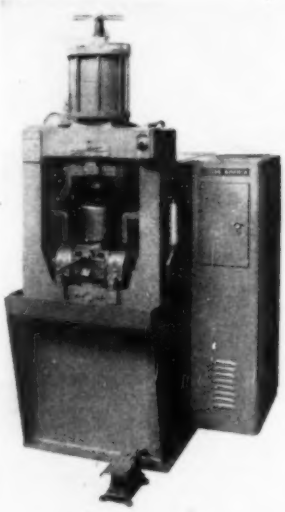
STUD WELDER—*Graham Mfg. Corp., 1643 National Bank Bldg., Detroit 26, Mich.* Capacitor-operator self-timed welder uses tip studs. Tip studs, on coming in contact with the work and fusing, cause ionization which allows a path for the main discharge current of the capacitor to form an arc sufficient to melt both the diameter of the ←stud and the workpiece.



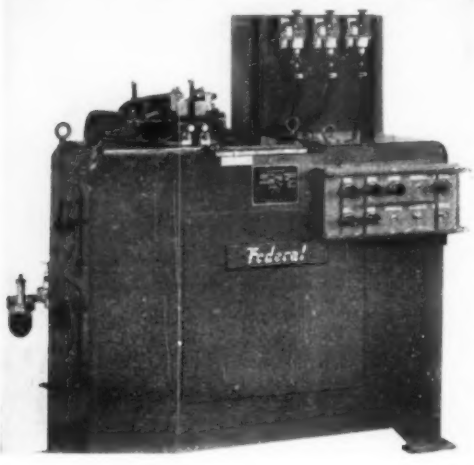
MILL — *American Electric Fusion Corp., 2600 Diversey Ave., Chicago 47, Ill.* Mill for converting strip into standard weight pipe transforms coils of flat strip into electrically welded pipe at speeds to 65 fpm. depending on diameter. Diameter sizes range from ½ to 2 in. Operation is automatic and includes forming welding, scarfing, sizing, straightening and cutting to length.



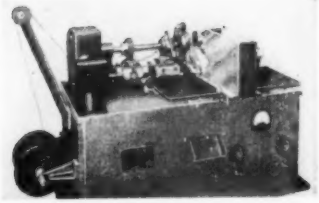
SPOTWELDING PRESS — *Clearing Machine Corp., Chicago, Ill.,* Spotwelding press, capable of handling large complicated sections, performs the welding job in one step. Several welds can be done simultaneously.



PRESS WELDER — *Taylor-Winfield Corp., Warren, Ohio.* Air-operated press welder is designed for annular projection welds requiring equal distribution of current around the weld and equalized welding force over the weld area. Welder is rated at 150 kva.



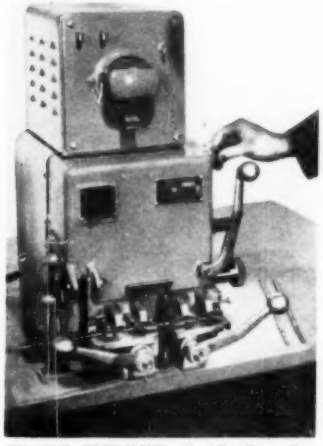
FLASH WELDER—*The Federal Machine and Welder Co., Plant 2, Warren, Ohio.* Type F-1, for welding flat mild-steel stock with a maximum width of 3 in., or for round and flat mild steel with a maximum cross-section of 0-17 sq. in., has platen size of 12x12 in. Operation is automatic or semi-automatic.



WELDING EQUIPMENT—*Tweezer-Weld Corp., Newark, N. J.* Machine for welding and shaping light, small parts difficult to process manually welds automatically by means of an electronic welding and timing device.

WELDERS — *Taylor-Winfield Corp., 1050 Mahoning Ave., Warren, Ohio.* Tri-Phase welders for resistance welding, with three-phase balanced power, gives a power factor of 95 percent at reduced power demand.

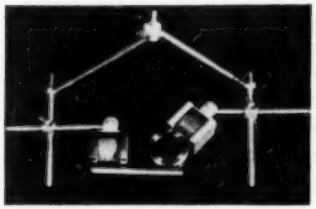
BUTT WELDER—*Agnew Electric Co., Milford, Mich.* Special-purpose automatic butt welder with indexing table welds nickel-ground wire to spark-plug shells. Called Type SPB-2, it has synchronous control of welding current and time.



FLASH WELDER—*DoAll Co., Des Plaines, Ill.* An all-purpose flash welder Model DBW-5 has a welding capacity of 5/16 in. dia. The production-type flash welder will join bandsaw blades up to 2 in. in width. Welding cycle is motor controlled and is also automatic.

SOLDERING GUNS—*The Weller Mfg. Co., Easton, Pa.* Two soldering-gun models are designed for use on 110 or 220 v. at 50 or 60 cycles, principally intended to meet requirements of export customers.

ELECTRODE—*All-State Welding Alloys Co., Inc., 96 W. Post Rd., White Plains, N.Y.* No. 4 machinable cast-iron electrode can be used either on ac. or dc. Electrode has a nickel core and is for use on cast iron wherever machinability and color match are required. It is available in 3/32-, ⅛-, and 5/32-in. dia.



WELDING POSITIONER—*du Mont Corp., Greenfield, Mass.* Minute Man Magnetic welding positioner consists of a V-frame equipped with two permanent Alnico magnets. Two or more pieces of ferrous metal are gripped and held in almost any position for welding, soldering, or other joining.

ELECTRODES—*Westinghouse Electric Corp., Pittsburgh 30, Pa.* Two Flexarc electrodes for dc. or ac. welding of cast iron are called Castingweld and Freemachineweld. Castingweld uses a mild-steel core wire and a special low-melting-point coating. Deposit is relatively hard and therefore not machinable. It is available in 3/32-, ⅛-, and 5/32-in. dia. Freemachineweld uses a pure nickel-core wire and is available in ⅛ and 5/32 in. dia.

ELECTRODE—*Westinghouse Electric Corp., P.O. Box 868, Pittsburgh 30, Pa.* Hydrogen-free, mineral-type, extrusion coated electrode said to eliminate underbead cracking called Flexarc LoH, is available from ¼- to ⅛-in. dia., and recommended for use with ac. and also for dc. reverse polarity.

ELECTRODES—*Westinghouse Electric Corp., Pittsburgh 30, Pennsylvania.* Line of 27 Flexarc stainless-steel electrodes covers a range of types and diameters from 1/16 in. to ¼ in. for commercial grades of chromium, nickel, and straight chromium steels. Electrodes come in two types: for welding ac. and dc. reverse polarity, and for welding with dc. reverse polarity only.

SPOTLIGHT—*Westinghouse Electric Corp., Pittsburgh 30, Pa.* Industrial spotlight for welding, cutting, or brazing work when viewed through a No. 10 welder's glass before strjking the arc casts a small-diameter circle of light from 2500-footcandle brilliance when placed 3 ft. from work to 1000-footcandle brilliance when located 6 ft. away.

PASTE — *Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* Paste designed to confine flow of molten alloys to the limited area to be welded, called Anti-Capillary Compound, protects parent metal from discoloration at welding temperatures and assists in retaining cleanliness and brightness of metal.

WELDING ROD—*Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* Eutechrom welding rod is designed as a universal rod to overlay worn or defective parts in cast iron or any kind of steel. The low-heat welding rod Eutechrom 2, (ac.-dc.) is available in sizes of ¼, 3/16 and ⅛ in.

WELDING ROD—*Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N.Y.* EutecRod 14 FC, a color-matching flux-coated torch welding rod, is designed for all types of gray or alloy cast iron. Rod is said to develop a tensile strength of 48,000 psi., in weld deposits.

WELDING ROD—*Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N.Y.* Gas-welding rod known as EutecRod, 188, with a maximum hardness to 67 Rockwell C, in a single pass, produces overlays on copper which are said to require no additional heat treatment.

COATED ROD—*Eutectic Welding Alloys Corp., New York 13, N.Y.* Eutecrod 1805FC for piping, tank, roofing and heating apparatus applications, is a thin-flowing, low-melting-point (brazing type) alloy. It is available in ⅛-in., 3/16-in., 3/32-in. and ¼-in. sizes, flux-coated, and 1/16-in. bare rod.

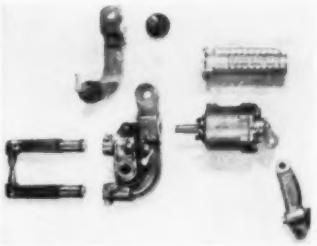
EUTECTIC ROD—*Eutectic Welding Alloys Corp., New York 13, N. Y.* Small-diameter electrode cuts thin sheet metal. The 3/32-in. diameter Cutrode is for cutting stainless steel, bronze, nickel and copper on small ac. welding machines. Rod is available in other sizes for heavier metal.

WELDING ROD—*Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* Eutecrod 16 in a 1/32-in. size for tight steel joints may be used in ring form and heated by torch or induction.

RECTIFIER — *Richardson-Allen Corporation, 15 West 20th St., New York N. Y.* Special units are for electrolyzing nickel and copper solutions. For 24-hour cleaning, the output of these units can be connected to a small auxiliary tank and pump. Stepless controls permit any voltage control from 0 to 1 volt. Models offered include 50-, 100-, and 200-amp.

ELECTRODE—*Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.* Airco No. 387 all-position arc-welding electrode for welding of mild steel is available in ⅛-, 5/32-, 3/16-, and ¼-in. dia. Electrode is available for both ac. and dc.

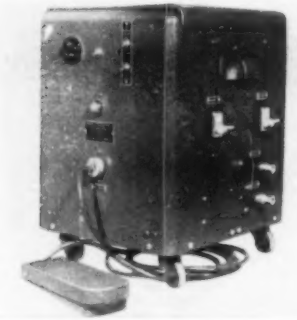
ELECTRODE — *Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.* No. 394 electrode operates on either ac. or dc., and gives welds of 100,000-psi. strength. The rod is a low hydrogen-type coated electrode.



SPOTWELDING GUNS—*Progressive Welder Co., 3050 E. Outer Drive, Detroit 12, Mich.* Line of standardized spotwelding guns are designed with and constructed from interchangeable standardized-component parts. Seven basic types, in heavy-duty and standard-duty versions, are said to take care of 95% of all gun-welding requirements.

AUXILIARY UNIT — *Glenn-Roberts Co., 2107 Adams St., Indianapolis 18, Ind.* Auxiliary unit used with ac. welders for inert-gas welding with Heliarc torches, called G-R Correct-Arc, incorporates high-frequency circuit to start and maintain arc without contact between work and electrode.

ELECTRODE HOLDER—*Metallizing Engineering Co., Inc., 38-14 30th St., Long Island City 1, N.Y.* Vibrating electrode holder, the Ruf-Tred tool, provides a method of preventing slipping and falling accidents on smooth steel or iron surfaces. Used with either ac. or dc. welding machinery, it deposits hard rough bead lines about ⅛ in. wide and 1/16 in. high.



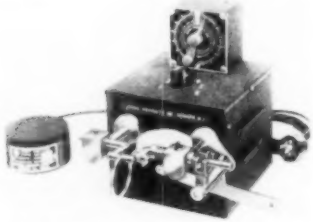
HIGH-FREQUENCY STABILIZER—*Hobart Bros., Co., Troy, Ohio.* Inert-gas welding attachments are for ac. transformer-type welders. The high-frequency stabilizer is designed for use with standard ac. transformer-type welders of 600 amp. or less.

ELECTRODE—*The Hobart Bros. Co., Hobart Square, Troy, Ohio.* Hobart Nickel-cast electrode is a 100% nickel electrode for producing machinable welds on cast iron without preheating the metal. Welds are machinable and can be drilled and tapped at any point in the weld zone.

ELECTRODE—*Hobart Brothers Co., Hobart Square, Troy, Ohio.* Electrode for shielded-arc welding of low-alloy high-tensile steels in the downhand positions, called Hobart No. 111HT, is available in 3/16- and ¼-in. dia., in 18-in. lengths. Current can be either ac. or dc.

ELECTRODE—*The Hobart Brothers Co., Hobart Square, Troy, Ohio.* Copper-nickel alloy electrode with a mineral-flux coating for metallic arc welding is called the Hobart Softcast A. Adaptable to welding cast iron where weld area must be machined, drilled or tapped, it is available in 3/32-, ⅛-, 5/32- and 3/16-in. dia. in 18-in. lengths, center brushed.

ELECTRODE—*Hobart Brothers Co., Hobart Square, Troy, Ohio.* Hobart No. 90-PL low-hydrogen electrode is designed for welding high-carbon, high-sulphur and other hard-to-weld steels without underbead cracking. Electrode is available in 3/32-, ⅛-, 5/32-, 7/32- and ¼-in. diameters for use with dc. welding current only.

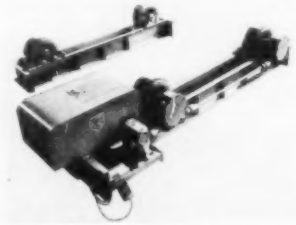


SOLDERING MACHINE—*Joyal Products, Inc., 12 Grafton Ave., Newark, N. J.* Production soldering machine for small hard- and soft-soldering jobs can also be used to anneal and harden small parts. Interchangeable electrodes are specially designed for each job. Automatic cut-off timer regulates soldering time.

ELECTRONS—*Harnischfeger Corp., Milwaukee 14, Wis.* A group of four hard-surfacing electrodes is listed as the P & H Hartop series. Hartop Brown offers a 35 to 40 Rockwell C Hardness and is designed for welds subject to angular shock and abrasion. Hartop Green is made for high resistance to impact and abrasion. Hartop Red is made for severe impact and abrasion has a hardness of 50 to 66. Hartop Yellow offers a hardness of 58 to 63.

HOLDER—*P. R. Mallory & Co., Indianapolis, Ind.* Leak-proof ejector-type light-duty holder for resistance welding is designed so that the water circuit forces water against the head of the electrode tip regardless of length. Tip removal is simplified and tip damage minimized by use of an ejector plug.

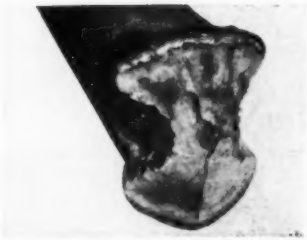
ELECTRODE METAL—*P. R. Mallory & Co., Inc., Indianapolis, Ind.* Mallory 22 metal, a high-conductivity copper-base alloy, contains cadmium and zirconium. Mallory 22 metal is a seam-welding electrode metal.



TURNING ROLLS — *Ransome Machinery Co., Dunellen, N. J., a subsidiary of Worthington Pump & Machinery Corp.* The turning rolls are designed to increase welding production. Anti-friction and self-aligning bearings are offered in the power and idler rolls.

ELECTRODES — *The McKay Co., Pittsburgh 22, Pa.* Electrodes 29.9 and 29-9Mo for stainless-steel welding, are available with either dc. or ac.-dc. coating. The normal operating currents are slightly higher than those used with ordinary stainless-steel electrodes.

SHUTOFF VALVE—*Linde Air Products Co., Unit of Union Carbide and Carbon Corp., 30 East 42nd St., New York 17, N.Y.* Shutoff valve is designed to prevent oxygen and acetylene waste in production welding. Known as the Oxweld V-31 dual-station shutoff valve, it controls fuel-gas supplies when used with the oxy-acetylene blowpipe.



ELECTRODES—*The Lincoln Electric Co., Cleveland, O.* Two electrodes of the coated tubular type deposit super-abrasion resisting surfaces of weld metal. Tungweld-C is a tubular, light coated electrode which contains in the tube coarse particles of tungsten carbides. Tungweld-F is a shielded arc tubular electrode containing fine particles of tungsten carbide.

ELECTRODE—*Lincoln Electric Co., Cleveland 1, Ohio.* Electrode, Toolweld A & O ("A" for air-quench, "O" for oil-quench), is for hard surfacing tools and dies. Electrode will operate on either ac. or dc. and is made in 3/32-, ⅛-, and 5/32-in. sizes.

ELECTRODE—*The Lincoln Electric Co., Cleveland 1, Ohio.* Softweld electrode deposits dense, soft, machinable welds in gray-iron castings. Softweld is a non-ferrous electrode and operates with a soft-steady arc on either ac. or dc.

ELECTRODES—*Lincoln Electric Co., Cleveland, Ohio.* Two tubular-type shielded-arc electrodes, Faceweld No. 1 and Faceweld No. 12, provide a higher consistency to the deposited alloy at a lower cost.

SOLDER—*Solder Div., Alpha Metals, Inc., 363 Hudson Ave., Brooklyn 1, N. Y.* Tri-Core Leakpruf acid-filled solder will solder stainless steel, monel, and nickel. Solder has three cores and uses a synthetic acid. The chalk-like, non-liquid acid-flux is soluble in water. Solder is packaged in 1-, 5-, and 20-lb. spools.

ELECTRODE — *North American Philips Co. Inc., 100 E. 42nd St., New York 17, N. Y.* Manual arc-welding electrodes are available in lime fetritic, iron oxide and organic types, and have a special type of coating. Called Norelco contact welding electrodes, two types can be used on a semi-automatic basis.

ELECTRODE—*Wilson Welder and Metals Co., Inc., 60 E. 42nd St., New York 17, N. Y.* An all-position arc-welding electrode for welding of mild steel, listed as No. 109, is available in ⅛-, 5/32-, 3/16-, 7/32-, ¼-, and 5/16-in. diameters.

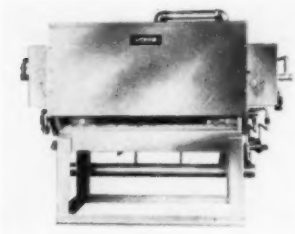
ELECTRODES — *General Electric, Welding Equipment Div., Schenectady 5, N. Y.* Four eletrodes, developed for use in a wide range of arc-welding application, are called Types W-60, W-61, and W-95.

BOX FURNACE — *Cooley Electric Mfg. Corp., 38 S. Shelby St., Indianapolis, Ind.* Model VK-6 electric box furnace features a temperature range from 2000 F. to 300 F. permitting hardening and other high-temperature work, as well as low-temperature applications such as a tempering or drawing of steels, non-ferrous heat-treating, and others.

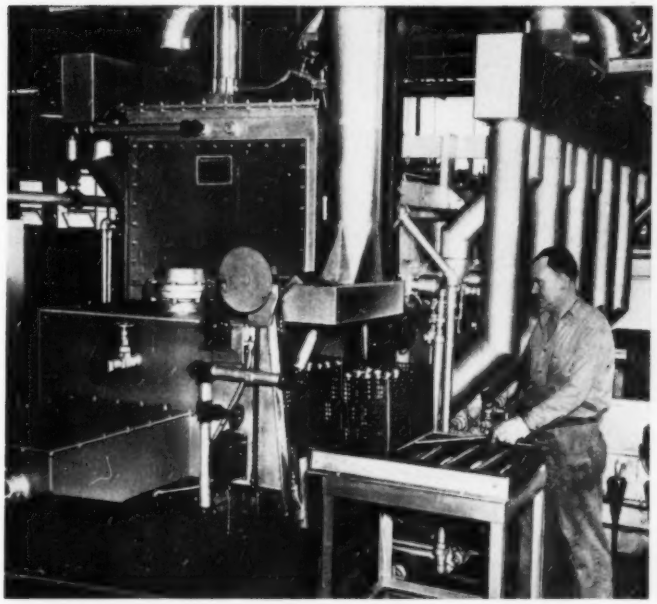
PREHEATER—*General Electric's Industrial Heating Division, Schenectady 5, N. Y.* A 3-kw., 40-megacycle preheater for preheating of plastic preforms operates on 230 v., single-phase, 60 cycles, and will heat 40 oz. of wood-flour phenolic compound from 70 F. to 250 F. in one min., or one pound of this material in 24 sec.

FURNACE—*Bellevue Industrial Furnace Co., 2971 Bellevue Ave., Detroit 7, Mich.* Furnace for the heating of spring leaves prior to forming has pusher-type walking-beam alloy rails driven by a combination mechanical and hydraulic drive. Maximum production rate is 3600 lb. per hr.

FURNACE—*The Lithium Co., 111 Sylvan Ave., Newark 4, N. J.* Lithium-atmosphere universal batch furnace is developed for control of heating and atmosphere. Treatment is said to leave a clean, non-carburized products. Temperatures range from 1200 to 2100 F.

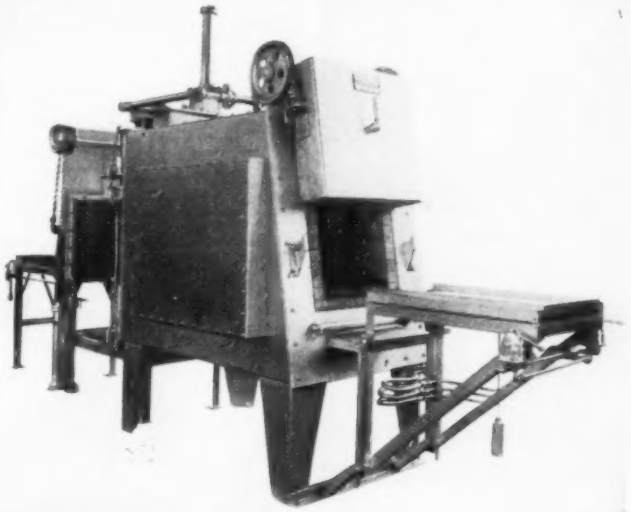


FURNACE — *The Lithium Co., 111 Sylvan Ave., Newark 4, N. J.* Lithium-atmosphere forge furnace is a direct-fired furnace in which forgings are heated free of scale. The single-slot types- run from 2-in. slot width and 8-in. hearth depth to 64 and 24 in., respectively.



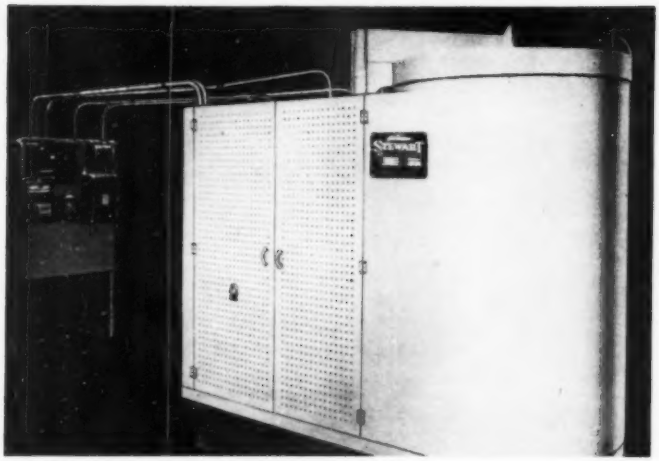
GAS-FIRED FURNACES — *Westinghouse Electric Corp., Pittsburgh 30, Pa.* Gas-fired furnaces for annealing, carburizing, drawing, hardening, spheroidizing, malleabilizing, normalizing, and dry cyaniding—supplement regular line of Westinghouse electrically heated industrial furnaces.

ATMOSPHERE FURNACE — *Lindberg Engineering Co., 2444 West Hubbard Street, Chicago 12, Ill.* All-purpose controlled atmosphere furnace is suitable for hardening steels. It is also used for brazing and sintering operations. Furnace will operate at temperatures to 2500 F.

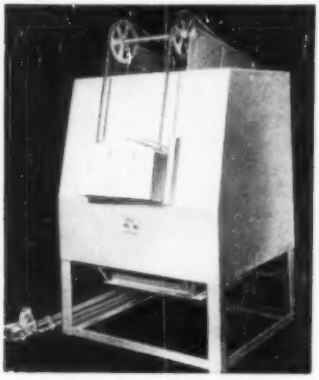


HEATER — *Radio Frequency Corp., Boston 34, Mass.* Low-cost high-frequency heater is for controlled and rapid brazing, soldering, and heat-treating of metals. The Model 3000-B produces a powerful magnetic field. Metal subjected to the field heats rapidly in a matter of seconds.

SALT-BATH FURNACE—*The Ajax Electric Co., Philadelphia, Pa.* Ajax Hultgren electric salt-bath furnace for heat treating in the temperature range of 300 to 2400 F., permits work, regardless of length, to be hung vertically. Electrodes are inserted through the side walls.



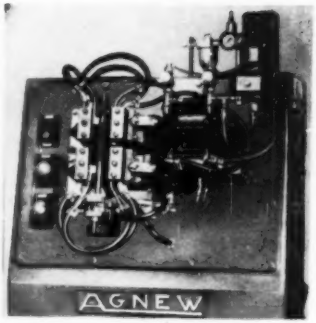
FURNACE—*Sunbeam Stewart Corp. 4433 W. Ogden Ave., Chicago 23, Ill.* Reverse-flow recirculating furnace, for close temperature control and uniform heating, employs damper arrangement at fan outlet which reverses direction of flow of gases through work at regular intervals. Furnace can be used for heat treatment of high-stress parts.



FURNACE — *Sunbeam-Stewart Co., Dept. 119, 4433 Ogden Ave., Chicago 23, Ill.* High-speed furnace for toolroom application features close temperature control and even heat distribution in a range of 1100 to 2500 F.

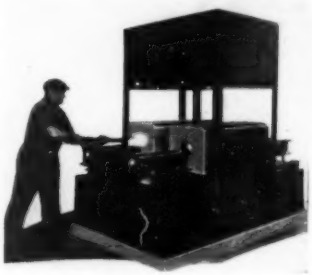
DRYING HEATER—*Edwin L. Wiegand Co., Pittsburgh, Pa.* High heat intensity and utilization of almost the entire infrared band are claimed for the Chromalox all-metal electric radiant heaters. These heaters are for drying, baking, pre-heating and dehydrating where a longer-wave infrared heat source is desired.

INDUCTION HEATER—*Ajax Electrothermic Corp., Trenton 5, N. J.* Self-contained high-frequency induction heater for reheating parts to the proper forging temperature, called the Ajax-Northrup induction heater, is located right at the forging machine and turns out one bar every 60 sec. —►



RESISTANCE HEATING — *Agnew Electric Co., Milford, Mich.* Resistance-heating machine is for localized annealing of truck-transmission shifter shafts which have been carburized and hardened and are to be straightened prior to grinding. The Model RH-1 is a single-station air-operated machine and is suitable for heating from $\frac{3}{8}$ to $\frac{7}{8}$ in. diameters, from 1 to $7\frac{1}{2}$ in. long.

HIGH-FREQUENCY UNITS—*Lepel High Frequency Laboratories, Inc., 39 W. 60th St., New York, N. Y.* Redesigned high-frequency units are available in $7\frac{1}{2}$-, 15- and 30-kw. ratings. They can be used for high-frequency heating on ferrous or non-ferrous materials.

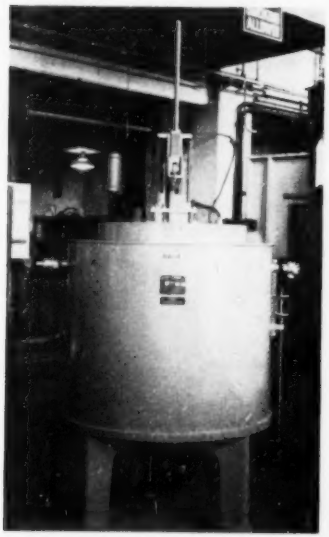


SALT BATH — *Dempsey Industrial Furnace Corp., 133 Main St., Springfield, Mass.* Continuous salt bath unit operates in heat-treating small parts. The unit includes two pot furnaces, a quench unit, wash unit and a dryer. Handling equipment is hydraulically operated, but manually controlled. A charge up to 125 lb. can be handled.

FURNACE—*The Lithium Co., 111 Sullivan Ave., Newark 4, N. J.* Lithium-atmosphere pit-type furnace controls the heat treatment of such products as sheet metal, tubular shapes, and other products. It is said to eliminate atmosphere variables that cause irregularities in carburizing or heat-treatment results. It is designed for heating operations to 2000 F.

FURNACE — *Lindberg Engineering Co., Laboratory Furnace Div., 2444 W. Hubbard St., Chicago 12, Ill.* Box-type laboratory furnace with temperature to 3000 F. top heat, and for continuous operation as high as 2500 F., is self-contained and can be used as a muffle furnace or with carbon blocks for non-oxidizing atmospheres.

FURNACE—*A. F. Holden Co., New Haven 8, Conn.* Holden Type 601 liquid electrode furnace has inside-pot dimensions of 13x9x19 in. The power conductors that transfer current to the pools which hold the liquid alloy are surrounded by refractory said to permit reduction in surface radiation area by 25%.



TEMPERING FURNACE—*Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa.* Series of Homo furnaces for high-precision tempering, performs continuously at 1650 F. Furnace handles high-temperature stress relief, cycle annealing, spheroidizing, normalizing and similar operations. Capacities vary from 15-in. dia. by 18-in. deep, to 35-in. by 60-in.

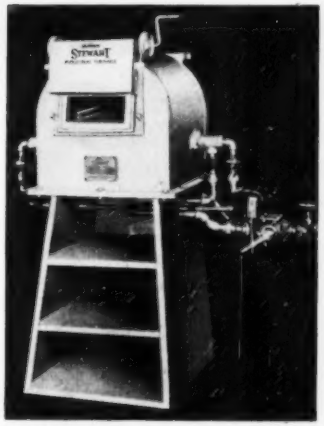
HOMO-TEMPERING FURNACE—*Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa.* Steam homo-tempering furnace is for scale-free tempering and strain relief of metal parts. Steel parts are being completed with a uniform blue-oxide finish.

OVEN CONVEYOR—*Ace Conveyor Industries, Inc., Detroit, Mich.* Vertical-Tower oven conveyor system includes a Burdett equipped gas-fired oven through which the conveyor runs. Painted parts to be baked or dried are carried on the conveyor.

FURNACES—*Thermo Electric Mfg. Co., 461 W. Locust St., Dubuque, Iowa.* Line of bench-type Temco Electric furnaces is for laboratory uses, and heat-treating of carbon and high-chrome steel parts and tools. Designated as Series 1500, 1600 and 1700, there are six sizes ranging in chamber dimensions from 4x3½x4½ in. to 8½x7½x18 in.

HEAT-TRANSFER UNIT—*Eastern Industries, Inc., 296 Elm St., New Haven 6, Conn.* Heat-transfer unit cools the magnetron power tube in an induction-heated oven. The heat generated by the magnetron tube is dissipated at the rate of 11,000 Btu. per hr., by circulating a cooling medium through the tube.

FURNACES, ATMOSPHERE GENERATOR—*Hevi-Duty Electric Co., Milwaukee 1,* Wis. Hevi-Duty Electric Temperite furnace is designed primarily for tempering or drawing of tool and die steels. Maximum operating temperature is 1250 F. Work chamber dimensions are 12½x13½x14½ in. The Hevi-Duty Atmo-Gen unit was developed for use as a small-capacity, atmosphere generator. The Treet-All Furnace is used as a small multi-purpose furnace for heat-treating operations to 1850 F.



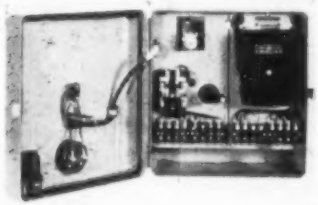
FURNACE—*Sunbeam-Stewart Industrial Furnace Div., Sunbeam Corp., 4433 Ogden Ave., Chicago 23, Ill.* Semi-muffled gas-fired oven furnace has a temperature range of 300 to 2400 F. Uniformity at low temperatures is obtained by increasing air over gas ratio, thus heating by convection. Furnaces have 4x8x12-in., 6x12x18-in. or 9x15x24-in. heating space.

FURNACES—*Lindberg Engineering Co., 2444 West Hubbard St., Chicago, Ill.* Pot furnace featuring cyanide pots that carry a one-year guarantee, known as the Lindberg Hi-Life gas-fired pot furnace, is available in four standard sizes using pots 24x21 in.; 20x21 in.; 16x18 in., and 12x18 in.

CONTROL CENTER—*Square D Company, 4041 N. Richards St., Milwaukee 12, Wis.* Dust-tight control center combines standard, general-purpose control-center units with heavily gasketed vertical sections. Units are available with circuit breakers through 600 amp.

CONTROLLER—*Square D Company, Milwaukee, Wis.* Class 8992 Type BBG-1 combination controller provides complete electrical control for small foot- or motor-operated resistance-welding machine. The single enclosure contains a NEMA 1A pneumatic weld timer, a size 1W, 100-amp., high-speed magnetic-welder contactor and a control transformer.

TEMPERATURE - CONTROL INSTRUMENTS—*Claud S. Gordon Co., 3000 S. Wallace St., Chicago 16, Ill.* Two straight-line temperature-control instruments, the Xactline-Capacitrol and the Xactline-Capacilog, combine the conventional pyrometer control features with the auxiliary devices for maintaining straight-line temperature control.



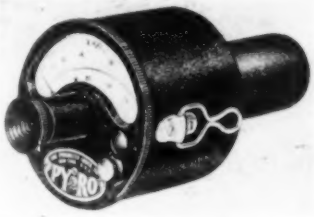
CONTROL SYSTEM FOR OIL BURNERS—*Control Div., General Electric Co., Schenectady 5, N.Y.* Control system for commercial oil burners is composed of a master control unit, a phototube unit, and an electrode unit. The photoelectric combustion-control system shuts off the flow of fuel when oil fails to ignite or flame is extinguished after igniting.

THERMISTORS — *Metallurgy Div., General Electric Co., Pittsfield, Mass.* Electrical semi-conductors that respond to temperature variations as small as one thousandth of a degree Centigrade, are made from mixtures of semiconducting metallic oxides, and are available in the form of rods, disks, and beads. Thermistors are used with either ac. or dc.

THERMOCOUPLE LINE—*The Industrial Instrument Service Co., 2785 E. Slauson Ave., Huntington Park, Calif.* Line of inclosed thermocouples for general foundry use called Thermo-Tips, are constructed in one piece in any length or shape. Thermo-Tips come in standard 18- and 24-in. lengths, straight or with 45° or 90° bends.

CUBICLES—*K & H Industrial Products Inc., Dept. 3½, 459 Morgan Ave., Akron 11, Ohio.* Standard line of cubicles are designed to take any and all types of control, recording, and indicating instruments. Type I is an individual cubicle. Type II consists of a specified number of cubicles welded together as a complete unit.

TEMPERATURE, PRESSURE RECORDERS—*Penn Industrial Instrument Corp., 3116 N. 17th St., Philadelphia 32, Pa.* Line of gas-filled temperature recorders and recording pressure gages, are available with one, two, three or four pens. Temperature-tube systems feature stainless-steel welded construction.



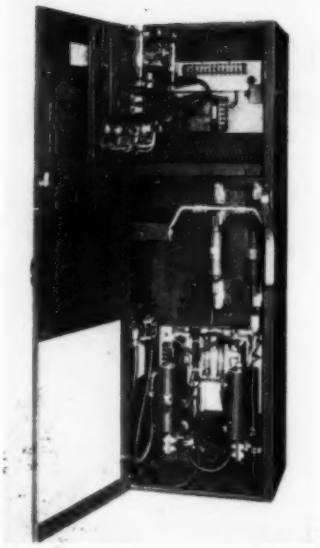
PYROMETER — *Pyrometer Instrument Co., 103 Lafayette St., New York, N.Y.* The Pyro radiation pyrometer is designed to determine temperatures above 1000 F. by thermo-electric principles. Instrument is self-contained and requires no outside connections, lead wires, batteries or other accessories.

PYROMETER—*The Bristol Company, Waterbury 91, Conn.* Proportional-current input electronic pyrometer-controller model IE 486, proportions the current input to electrically-heated furnaces, ovens, plastic molding machines, salt pots, and other similar equipment to provide practically straight-line temperature control.

TEMPERATURE CONTROLLERS—*K. H. Huppert Co., 6830 Cottage Grove Ave., Chicago 37, Ill.* Stepless-input temperature controllers for use with electric and gas heating units are available with or without pyrometers. Rated capacity of the plugs is 15 amp.

PYROMETER RECORDER, CONTROLLER—*Electric-Arc, Inc., 152-162 Jelliff Ave., Newark 8, N. J.* Portable electric pyrometer recorder and controller is arranged so that six points of heat to 2200 F., can be recorded and controlled. It can be used for semi-automatic or automatic control.

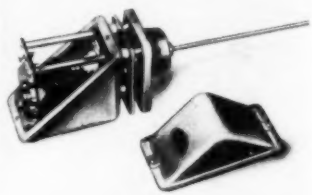
SELECTOR — *Surface Combustion Corp., Toledo 1, Ohio.* An atmosphere selector for atmospheric gases is said to increase the effectiveness of their dew-point recorder by enabling it to analyze consecutively atmosphere from as many as six different sources, including generators and furnaces, in timed sequence.



CONTROL—*Weltronic Co., 19420 W. Eight Mile Road, Detroit 19, Mich.* Non-synchronous control combination Series K is for foot-operated spot, projection, and butt welders. Power-supply unit is universal for all timers and operates on 208-, 230-, 380-, 460-, or 575-v. power source.

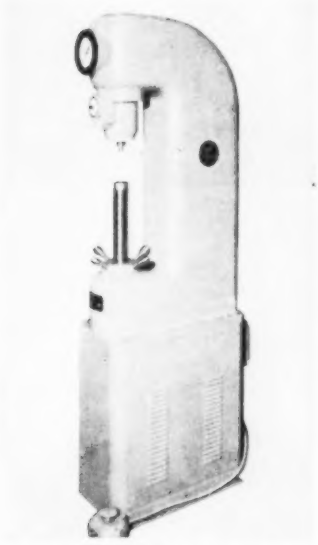
THERMOCOUPLE PROTECTING TUBE—*Claud S. Gordon Co., Chicago, Ill.* Heavy-wall, cast-iron, thermocouple protecting tube used for molten aluminum, zinc and die-casting metals, called Servrite, is cast with both ends open. Tubes are furnished with ⅜-in. wall thickness and 15/16-in. I.D.

DYNALOG — *The Foxboro Co., Foxboro, Mass.* Multi-record Dynalog electronic recorders make from 1 to 6 different records on one circular chart. Records are colored dots closely spaced. A positive-acting switching unit automatically brings the varicolored pens into recording position at 6-sec. intervals in any sequence desired.

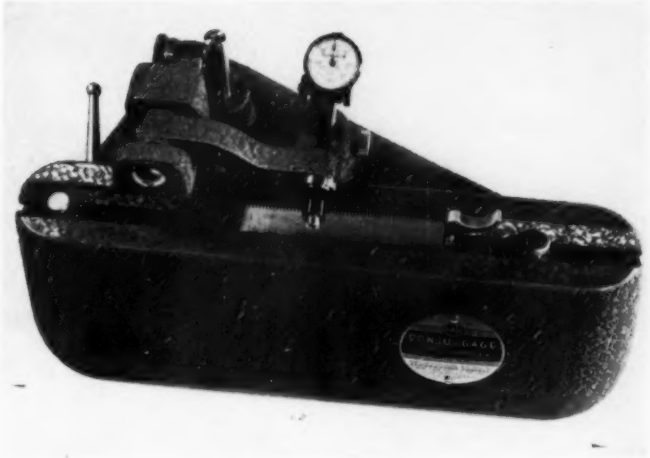


FLAME-FAILURE PROTECTION—*Combustion Control Corp., 77 Broadway, Cambridge 42, Mass.* Fireye system FF-6 provides electronic flame-failure protection and semi-automatic ignition control for all types of commercial and industrial gas-burning equipment as well as for oil-fired equipment having continuous gas-pilot ignition.

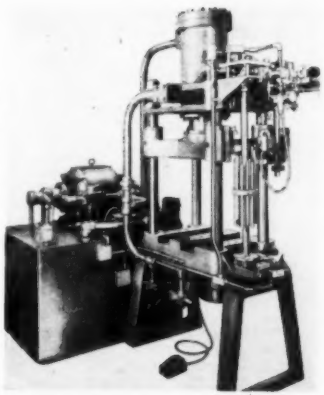
Layout and Inspection



TESTING MACHINE—*Steel City Testing Machines, Inc., 8843 Livernois, Detroit 4, Mich.* Brinell hydraulic testing machine, Model KDR is capable of checking to 800 pieces per hr. Machine is equipped with a comparator indicator.

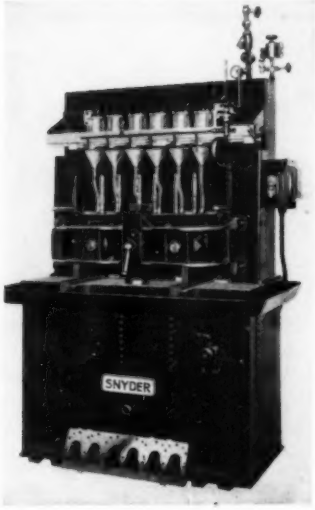


GEAR CHECKER—*Eastman Kodak Co., Rochester 4, N. Y.* Model 1-S Conju-Gage is a gear checker for checking spur or helical gears of any helix angle. Conju-Gage provides a composite check of spur and helical gears of pitch diameter up to 1.25 in.

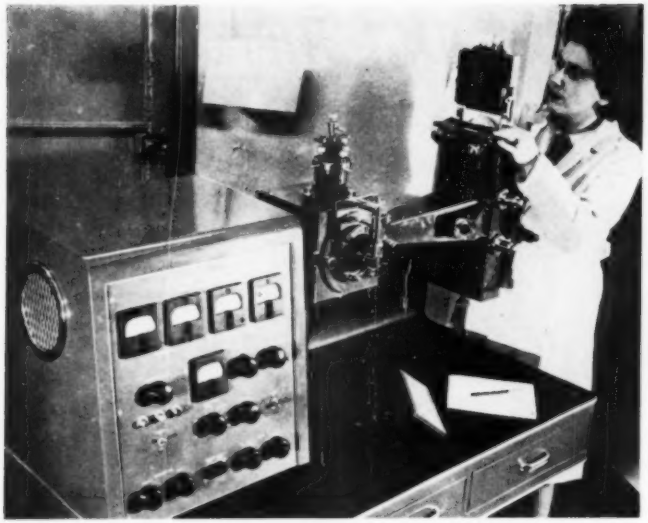


LOAD TESTER — *Hunter Pressed Steel Co., Lansdale, Pa.* Model 217P load tester will test 50 to 200 springs with an accuracy of one part in 2500 at maximum load, and do it in from 15 min. to an hour. It will handle loads of up to 5 pounds, and spring lengths up to 12 in. The dial indicator has a 1-in. range with 0.001-in. graduations.

HARDNESS TESTER — *Clark Instrument, Inc., 10200 Ford Rd., Dearborn, Mich.* Superficial hardness tester for Rockwell testing is designed for testing surfaces that must not be marred, even by standard Rockwell indentation. Depth of penetration is held to limits of 0.005 in. or less. It is available with 8-, 12-, or 16-in. vertical capacity.



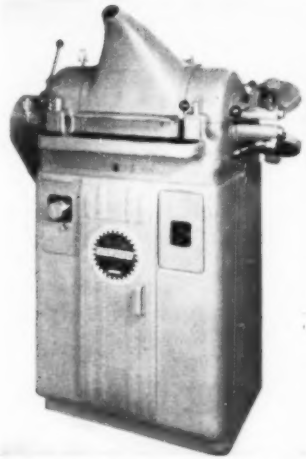
SPECIAL MACHINE—*Snyder Tool & Engineering Co., 3200 E. Lafayette, Detroit, Mich.* Testing of automotive cylinder-head volume is accomplished by this special machine. Liquid is allowed to pass into the cylinder-head combustion chamber, and, rising in the glass gages, registers volumetric content of each chamber.



DIFFRACTION INSTRUMENT—*Special Products Div., General Electric Co., Schenectady 5, N. Y.* Research tool, the electron diffraction instrument for studying surfaces and thin films, can be used in the observations and measurement of surface conditions of metals, ceramics and plastics. Specimen chamber permits examinations of work from 0.1- to 4-in. dia.

CHECKING FIXTURE — *Michigan Tool Co., 7171 E. McNichols Road, Detroit 12, Mich.* Universal "Sine-Line" checking fixture Model 471-A, is offered for checking gears, blanks, hobs, worms, worm blanks, milling cutters, and form tools up to 10-in. O.D. in 8-in. maximum face width.

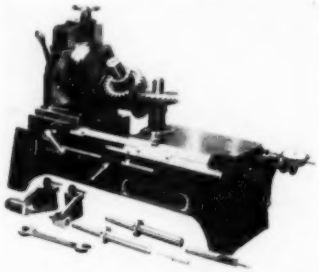
OSCILLOSCOPE — *Hickok Electrical Instrument Co., 10692 Dupont Ave., Cleveland 8, Ohio.* A 5-in. oscilloscope is offered for industrial and laboratory use. Listed as the Model 195B, it has high gain amplifiers, sensitive to 0.015 v. (15 mv.) per in.—30 cycles to 1 mc.



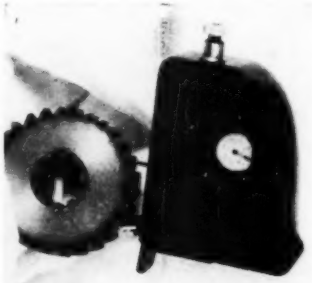
GEAR-SOUND TESTER — *National Broach and Machine Co., Detroit, Mich.* Red Ring gear-sound tester, studies the operation of gear sets at various speeds and loads without other sound interference.

DIAMOND PENETRATORS—*Clark Instrument, Inc., Dearborn, Mich.* Two improved diamond penetrators are for Rockwell testing. The "C" model fits all makes of testers for standard Rockwell testing, and the "S" model for superficial Rockwell testing.

VIBROMETER — *General Electric's Special Products Div., Schenectady 5, N. Y.* Recording vibrometer measures and records frequency displacement and wave shape of mechanical vibration. The vibrometer can be mounted on a fixed base or held in the hand.

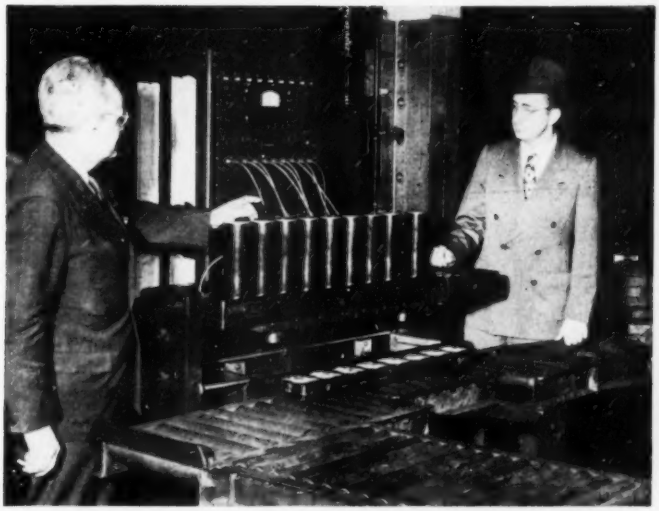


GEAR TESTER—George Scherr Co., 200 Lafayette St., New York 12, N.Y. Redesigned 9-in. Parkson gear tester incorporates an adjustable stop-rod in addition to precision scale and vernier which are used for setting of center distance. Available for spiral, spur, bevel, and worm gears, either in combination or single-purpose models.



GEARMASTER—*Urbauer Engineering Co., Naperville, Ill.* System of measuring and checking spur, and helical gears, called the Gearmaster, consists of a precision micrometer and specially designed gear charts. Chordal measurements, tooth spacing, tooth thickness, diametral pitch, pressure angle, backlash allowance, and pitch diameter are determined in one operation.

GEAR TESTER—*George Scherr Co., Inc., New York 12, N. Y.* Post-war models of Parkson gear tester are for accurate checking of spur gears and worm gears. The worm now integral with the shaft rests in 2 V-brackets on a typical worm-gear setup.

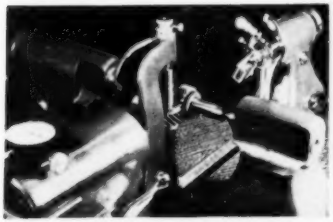


MEASURING SONIC VIBRATIONS —*Poole Manufacturing Engineers, Dallas, Texas.* Sonic vibrations too faint for the human ear to measure are being used to measure the volume capacities of high-compression cylinder heads for the 1948 Futuramic Series 98 engine for the Oldsmobile Div., General Motors Corp., Lansing, Mich.

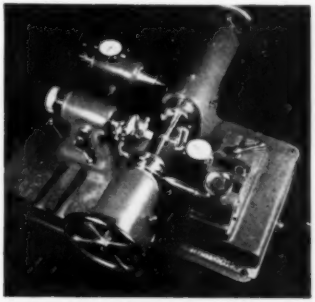
GEAR CHECKER, LEAD COMPARATOR—*National Broach and Machine Co., Detroit, Mich.* Red Ring universal gear checker and lead comparator can check for tooth spacing, helical angle, wobble, eccentricity, tooth size, lead of helical gears, and parallelism of spur gears as well as amount and position of crown on gears having teeth with elliptoid form.

TESTER — *General Electric's Meter and Instrument Divisions, Schenectady 5, N. Y.* Portable oven-temperature tester checks the performance and efficiency of heating appliances. Listed as Type DO-50, instrument has a range from zero to 650 F.

INTERFEROMETER — *Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N. Y.* Interferometer for measuring flatness of surfaces, can be used at various room temperature. Surfaces with as much as a 4-in. recess can be viewed. Instrument illustrated has a 1⅞-in. capacity.



GEAR CHECKING HEAD—*National Broach and Machine Co., 5600 St. Jean Ave., Detroit 13, Mich.* Checking head is designed to determine the helix-angle wobble of a gear, its size, eccentricity, and roughness of roll simultaneously or separately, by rolling the work gear with a master gear.

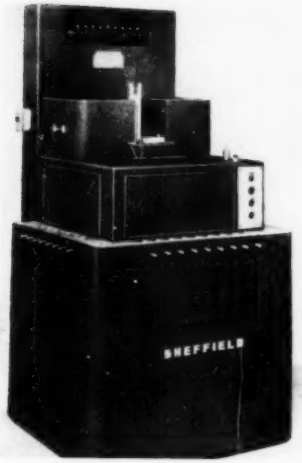


GEAR CHECKER—*National Broach and Machine Co., 5600 St. Jean Ave., Detroit 13, Mich.* Universal gear checker handles gears to 10 in. O.D. The small gear checker checks leads, eccentricity, and both tooth spacing and tooth parallelism.

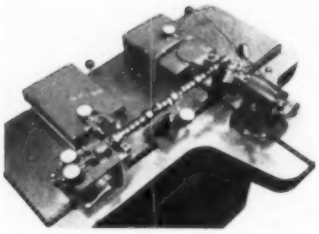
MAGNIFICATION CHECKER — *The Engineers Specialty Div., Universal Engraving and Colorplate Co., Inc., Buffalo 8, N. Y.* Magnification checker for use on all optical comparators and projectors checks the mirror adjustment and magnification of lenses on optical comparators and projectors.

ATCOTRAN INDICATOR—*Automatic Temperature Control, Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.* A pressure indicator with three 72-in. scales, the Atcotran 3-channel indicator, will accommodate any one or any group of Atcotran pressure measuring cells, permitting the electrical transmission of intelligences to one focal point for accurate readings.

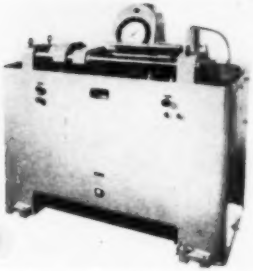
TESTING MACHINE — *Riehle Testing Machines, Div., American Machine and Metals, Inc., East Moline, Ill.* Hydraulic testing machine, PH-60, for tension, compression and transverse tests, has a capacity of 60,000 lb. Machine features loading, pumping, and indicating units inclosed in a single housing. ←



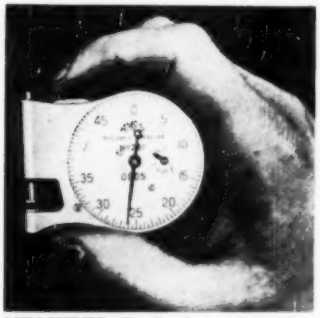
GAGING MACHINE—*Sheffield Corp., Dayton 1, Ohio.* Machine automatically segregates lapped-finish parts into 27 classifications without marring. Valve plates about the size of a half-dollar and twice as thick, are hand fed into a vertical loading stack, and are first checked and segregated into three 0.0004-in. major classifications of diameters.



CHECKER—*National Broach and Machine Co., 5600 St. Jean Ave., Detroit 13, Mich.* Combination gear-and-camshaft checker checks camshaft elements held to close dimensional limits. Camshaft is laid on two journal-bearing support blocks and rotated by hand, while readings are taken.



TESTING MACHINE — *City Steel Testing Machines, Inc., 884 Livernois Ave., Detroit 4, Mich.* Hydrostatic testing machine is for pressures up to 20,000 psi. The tube testing machine seals the end of the tubing without any perceptible flare. Cycle time can be predetermined, and the machine automatically reverses.



MEASURES—*B. C. Ames Co., Waltham 54, Mass.* Dial thickness measures are especially suited for accurate measuring of tissues, cellophane, and similar items. Four models are available, two of which are 0.0005-in.-graduated models.

GAGE—*Veteran Machine Works, 511 S. Laflin St., Chicago 7, Ill.* Center Master gage for checking size of 60° center holes, is available to check the sizes of 90° and 82° countersunk holes. Gage gives diameter of center holes by a direct indicator reading, with no setup or calculations.

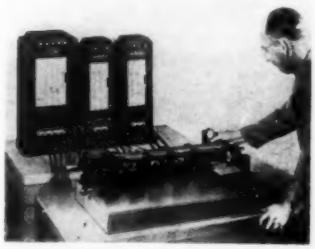
BALL-GAGING MACHINE—*Koehler & Sons, Horsham, Pa.* Rotary ball-gaging machine has dual sets of gages. No. 1 machine gages from 1/32-in. balls at a rate of 52,000 per hr. to ½-in. balls at 15,000 per hr. Change units consisting of 8 feed tubes and 6 conveyor plates and cones handle a range from 1/32 to ½ in. The No. 2 machine gages from ½- to ¾-in. balls at 5000 per hr.

DIAL INDICATOR—*L. S. Starrett Co., Athol, Mass.* Vest-pocket indicator for checking paper, leather, sheet metal and wire features direct readings to thousandths. A small dial in the center indicates hundredths. The spindle is raised to the maximum range of ¾ in by a sliding, serrated plate on top of gage. →

DIAL BORE GAGE—*Nilsson Gage Co., Inc., Poughkeepsie, N. Y.* Nilco dial bore gage is a visible-control inside-diameter indicator gage. The portable unit is designed for rapid and accurate measurement of small internal diameters. The dial indicator has graduations in 0.0001 with a total travel of about 0.008.

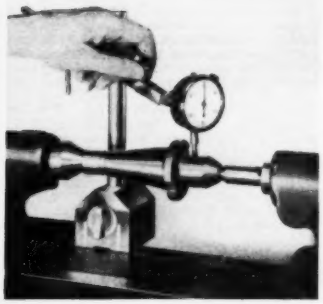
AUTOMATIC CHECKING MACHINE — *Sheffield Corporation, Dayton 1, Ohio.* Piston pins are checked for average diameter and automatically segregated into six classifications. Production segregating rate is approximately 2400 pins per hr.

DIAL COMPARATOR—*B. C. Ames Co., Waltham 54, Mass.* Heavy-duty dial comparator, the No. 130, can be used to check heavy parts, such as large-diameter shafts, and solid blocks having large cross-sections. Indicator usually furnished is Ames Model No. 202 with lift lever; dial graduated 0.001 in., and dial reading 0-100.

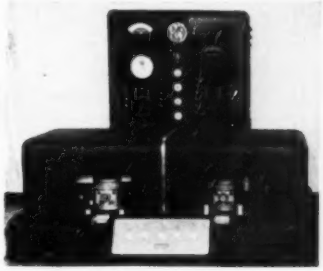


CAMSHAFT PRECISIONAIRE — *Sheffield Corp., Dayton 1, Ohio.* Unit permits gaging of most critical dimensions and conditions of an automobile camshaft. Six bearing diameters and two lengths of the camshaft are checked with Airsnaps used in conjunction with a five-column and a three-column Precisionaire base instrument.

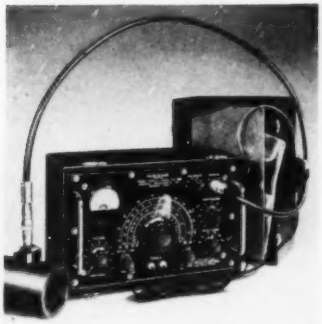
DIAL GAGES — *Cavalier Gage Co., Poughkeepsie, N. Y.* Series of 16 dial snap gages for cylindrical checking cover range up to 8 in., each gage covering ½ in.



SMALL TOOLS — *Brown & Sharpe Mfg. Co., Providence 1, R. I.* Dial-holding rods with fine adjustments, illustrated, are offered in two sizes: the 0.375-in. diameter rod for dial-test indicators No. 730, 733, 744 and 744A, and the 0.738-in. diameter rod for dial-test indicators No. 731 and 731A. Also offered is No. 226 ball attachment which snaps on anvil or spindle end of a micrometer caliper. A center and small-hole attachment set, No. 573, converts a 6-in. or 150-mm. vernier caliper into a direct-reading divider. Also offered is a permanent-magnet chuck, No. 408, suited for use on small surface-grinding machines, and bench grinders.



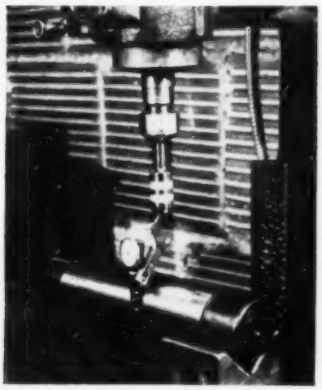
PISTON GAGE—*Pratt & Whitney, Div., Niles-Bement-Pond Co., West Hartford, Conn.* Multiple-station piston gage, for automotive pistons and similar parts utilizes a combination of three gaging mediums; the Electrolimit, the Air-O-Limit and the electric-contact method combined to check 14 different dimensions on the piston.



THICKNESS DETECTOR — *Branson Instruments, Inc., Danbury, Conn.* Audigage thickness detector, model FMSS-5, is used for non-destructive thickness measurement of steel, copper, aluminum, glass, unfilled plastics and other materials, from one side. The instrument is portable and battery operated for field use.

GAGE—*Federal Products Corp., 1144 Eddy St., Providence 1, R. I.* Automatic dimensional-recording gage, Model 500, measures a workpiece and records resulting dimension on a continuous tape which is ruled off in increments of 0.001 and 0.0005 in. Gage will check within limits of −0.003 in. to +0.003 in.

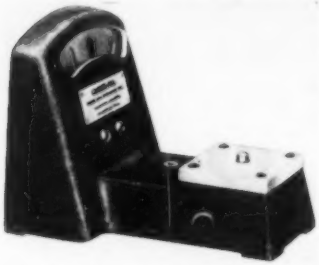
GAGE—*Swedish Gage Co. of America, 8909 Alpine, Detroit 4, Mich.* Ridermikrokator is intended for checking out-of-roundness and diameters of cylindrical parts. Measurements are carried out according to the three-point principle.



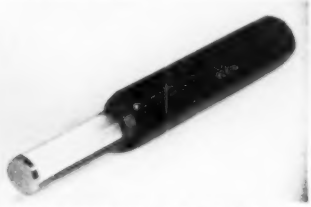
HOLDER—*Phillips Bros. Screw Products Co., 124 S. Howard Ave., Lansing, Mich.* Indicator holder is the universal type. The arm holding the indicator can be turned 360° in its holder and can swing 90° either side of center.

GAGE—*Moore Products Co., H & Lycoming St., Philadelphia 24, Pa.* Pneumatic comparator gage, Type C, has interchangeable calibrated dials with 3¼ in. of pointer travel for a full scale indication of 0.0004 in. at the highest magnification.

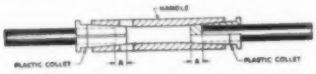
LAYOUT and INSPECTION



GAGE—*Roper & Broderick, Inc., 169½ Main St., Springfield, Mass.* Universal production gage called the Check-all gage, gives a multiplication of approximately 200 to 1 and will check up to ±0.010-in. tolerance.



GAGES—*Sapphire Products Div., Elgin National Watch Co., Aurora, Ill.* Metal-tipped sapphire plug gages are offered. Metal leader is metallically bonded to the gaging member. Sizes range from 0.020 to 1.000 in.



COLLET-HELD PLUG GAGES — *Turner Bros. Inc., 2625 Hilton Road, Ferndale 20, Mich.* The "go" and "no go" gage members are held at opposite ends of the gage handle by means of a self-locking plastic collet. Called Plast-O-Lock, gages are available in dia. from 0.0050 to 0.690 in.

GAGES—*Threadwell Tap & Die Co., Greenfield, Mass.* Line of products consisting of standard, conventional-type fixed gages includes plain plug and ring gages, thread gages, snap gages, dial-indicator snap gages, and special fixed-size gages.

PLUG GAGE—*The Standard Gage Co. Inc., Poughkeepsie, N. Y.* Chromium-plated DuBo plug gages are recommended for especially long runs and for checking the more abrasive materials such as aluminum castings.

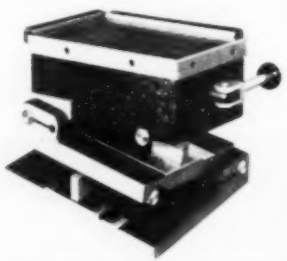
GAGE—*Sapphire Products Div., Elgin National Watch Co., Aurora, Ill.* Sapphire Gage, the Tipt-Type, has approximately ¼-in. sapphire tip metallically bonded to the leading end of the steel member.

GAGE—*United States Rubber Co., Rockefeller Center, N.Y.* Device for measuring hardness of rubber and similar compounds known as the Rex hardness gage is operated when indenter at one end is pressed against surface to be tested.

DIAL SNAP GAGE—*The Nilsson Gage Co., Inc., Poughkeepsie, N.Y.* Nilco dial snap gage is machined from rolled magnesium with angles at 45°. A vernier-type adjusting stud permits ¼-in. adjustments in the gaging pin or movable anvil. Adjustment can be locked with gaging pin remaining free for checking.

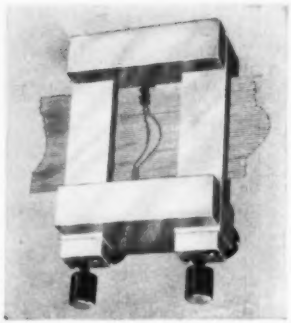
INSPECTION DEVICE—*The Cleveland Republic Tool Corp., 1265 Union Commerce Bldg., Cleveland 14, Ohio.* Inspection device, the Indexmaster, eliminates the sine-bar method of inspection by providing standard gage-block measurement for layout, checking and inspection operations.

MICROMETER — *Richards Machine Tool Co., 124 S. Isabel St., Glendale 5, Calif.* Model L longitudinal duplex micrometer is designed for inside work to take both inside and outside measurements of grooves and flanges on the inside of a bore. It will reach into an opening down to ½ in.



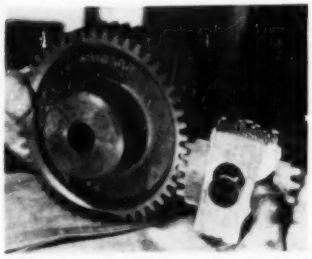
MAGNA-SINE WITH MAGNETIC CHUCK—*Robbins Engineering Co., 518 Midland Ave., Detroit 3, Mich.* The Magna-Sine with the electric-magnet chuck is used for precision angular set-ups on operations such as inspection and grinding. Angles are set up by the sine-bar method using standard gage blocks.

VERNIER CALIPER—*The George Scherr Co., Inc., 200 Lafayette St., New York 12, N.Y.* Swiss-made rustless-chrome vernier caliper for measuring from 6 to 6 in. in 1/1000 in. and 1/64 in. is for outside, inside and depth dimensions.



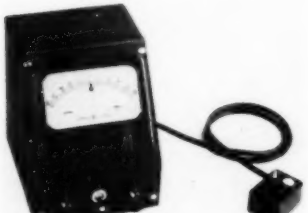
GAGE—*Accessories and Parts Div., Thompson Products, Inc., Cleveland, Ohio.* Contour transfer gage for measuring any radius or contour can be used to check die-cavity contours and production-line parts. Unit provides a means for reproducing many curves, difficult to gage directly, in a measurable form.

GAGE—*Penjaska Tool Co., Owosso, Mich.* Gage for checking form and hole sizes in tool, die and machine work utilizes telescoping and flush pin-gage principles. Gage measures openings of angles, radii, internal tapers and similar work.



GEAR GAGE—*George Scherr Co., 200 Lafayette St., New York 12, N. Y.* Gear gage is made of stainless steel with a 20° pressure angle full-length tooth forms 3-4-5-6-8-10-12-16-20-24-32-48 and stub tooth forms 3/4-4/5-5/7-6/8-8/10-10/12-12/14-16/21-20/26-24/32-32/42-48/64. Gages are used for a quick check of gears.

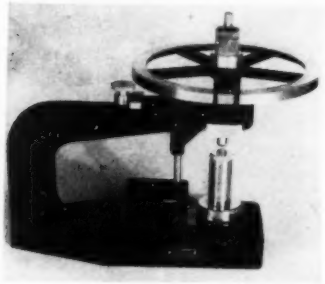
PRECISION TOOL—*Mic-Lap Co., 68 Devonshire St., Boston, Mass.* The Mic-Lap permits lapping the anvil and spindle bottom of micrometers parallel as well as to a 90° angle to the axis of the spindle.



MICROMETER—*Stevens-Arnold, Inc., 22 Elkins St., South Boston 27, Mass.* Electric Micrometer for measuring and gaging operations is suitable for telemetering where remote indication of small movements is desired.

MICROMETERS—*L. S. Starrett Co., Athol, Mass.* Friction-thimble and block-frame micrometers are offered with a satin-chrome finish. This finish results in a glare-free non-reflecting surface. Decimal equivalents of 8ths, 16ths, 32nds, and 64ths are marked on frame.

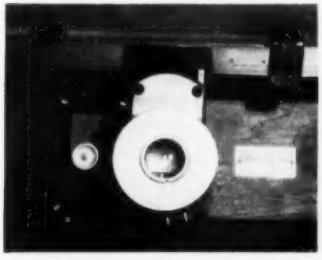
CALIPERS — *Woodworth Specialties Corp., Binghamton, N. Y.* Indicator calipers have hollow legs, one of which incloses a spring-actuated hand. Calipers are made in the 4-in. size, but will adjust somewhat larger if necessary.



MICROMETER—*The Van Keuren Co., 176 Waltham St., Watertown, Mass.* A zero to 3-in. light-wave micrometer features a specially designed ½-in.-dia., 40-tpi., heavy-duty precision micrometer head, an 8-in.-dia. micrometer wheel with 0.0001-in. graduations, and a vernier index which reads to 0.00001 in.

MICROMETER — *Electro Products Laboratories, Chicago, Ill.* Dynamic micrometer will measure movement, radial displacement or vibrations of ferrous parts when used in conjuction with the DuMont 208 Oscillograph or equivalent. No calibrating or interpolating is necessary to obtain a reading.

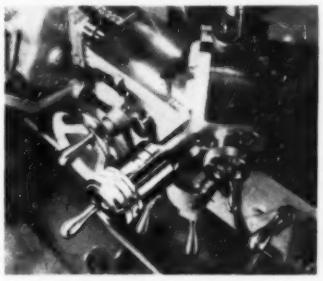
CENTER SCOPE—*Center Scope Products, 3829 San Fernando Rd., Glendale 4, Calif.* Series M center scope with a body length of 2¾ in. and a shank diameter of ⅜ in. by 1 in. long is used for precision-locating needs on lathes, drillpresses, jig borers, and vertical boring mills.



MEASURING SCALE—*F. T. Griswold Mfg. Co., Lancaster Ave., Wayne, Pa.* Linear measuring device is called the Scan-a-Scale. It provides a method of controlling table and spindle movements. It is used with a standard reference scale, and consists of a microscope fitted with a movable reticle screen controlled by a graduated dial permitting table setting to within 0.0002 in.

MICROMETERS—*The L. S. Starrett Co., Athol, Mass.* Tubular-frame micrometers for large-capacity precision measuring, are available with blow-type (C-shaped) frames for measuring by thousandths over a 6-in. range in eight capacity ranges from 12-18 in. up to 54-60 in.

MICROMETER ATTACHMENT — *Richards Machine Tool Co., Glendale, Calif.* Attachment for outside micrometers, the Rimat Microdapter allows measuring of internal dimensions.



CROSS-FEED DIAL—*Springfield Machine Tool Co., Springfield, Ohio.* Tri-Set direct-reading micrometer cross-feed dial allows any one of three individual direct readings to be selected for turning, boring, or depth of cut. All three readings are combined in the one indicator. Direct readings in thousands of an inch are given.

DIRECT-READING DIAL—*Van Dyke Instruments, Inc., 1401 Airway Drive, Glendale, Calif.* Direct-reading dial is for use on small- and medium-sized lathes, milling machines and other machine tools. Called the Revodex dial, it consists of two intergeared dials, the first reading in 0.001 in. and the second reading in 0.1 in.

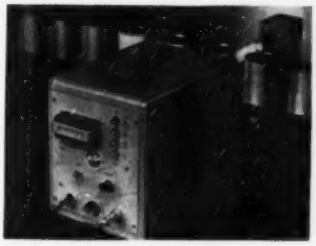


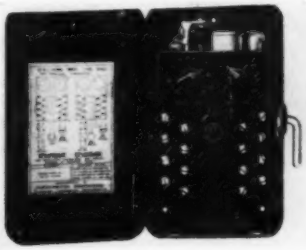
PHOTO-ELECTRIC COUNTER—*Potter Instrument Co., Inc., 136-56 Roosevelt Ave., Flushing, N. Y.* High-speed photo-electric counter, listed as Model 310 counter, is a self-contained package including a photo-electric detector, electronic decade and a six-digit electromechanical register.

TACHOMETER—*O. Zernickow Co., 15 Park Row, New York 7, N. Y.* Chronometric tachometer shows per minute speeds, rpm., and fpm., in 3 sec. (Type A), and 6 sec. (Type B). Timing is automatic with no stop watch needed. Pushbutton operation allows speeds to be read at leisure.

RECORDER — *Electric Tachometer Corp., 22nd and Vine St., Philadelphia, Pa.* Speed and production recorder, Model R-300-H, is a gear-driven unit electrically operated which produces a permanent record of speed and production.

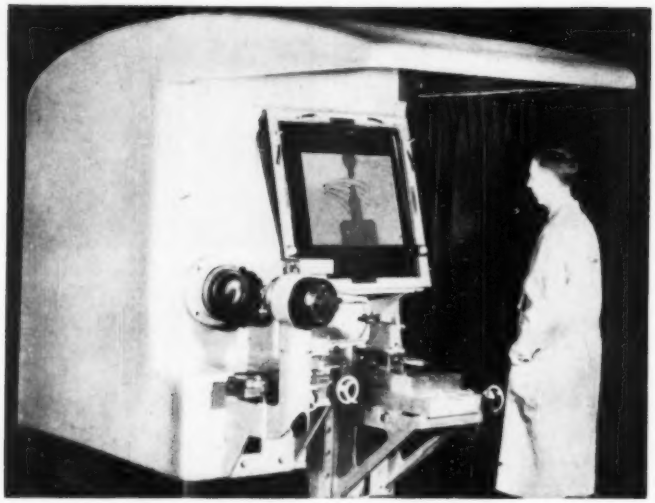
ELECTRIC TACHOMETER — *Electric Tachometer Corp., 2218 Vine St., Philadelphia 3, Pa.* Small-size electric tachometer is designed for continuous operation. The unit measures 2¾x5¾ in. It will operate in any position through a wide range of temperatures. Listed as Model M-1200, it is equipped with a large driving shaft.

COUNTING INSTRUMENT — *Electronics Div., Lansing Engineering Co., Lansing, Mich.* Electronic instrument for counting and recording pieces produced by an electric motor-driven machine which places a distinct load on the motor for each piece produced is called the Lectro-Count.

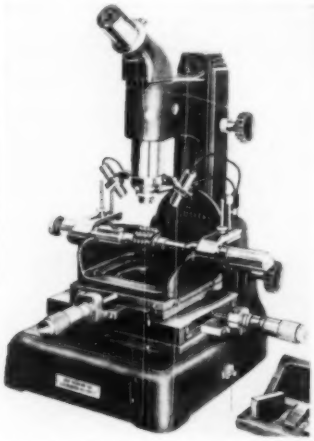


TIMER—*Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.* Electronic timer series 30 is for machinery and process control. Unit has a range of from 0.03 sec. to 4 min. and is recommended for control of hydraulic presses, spot welders, and similar equipment.

CONTACT POINTS—*Corundum Co., Inc., 1777 E.87th St., Cleveland 6, Ohio.* Sapphire- and ruby-tipped dial-indicator-gage contact points have points made with hexagonal buffed stainless-steel bodies 0.187 in. across flats and 0.437 in. long with 4-48 thread and 0.187 in. long.

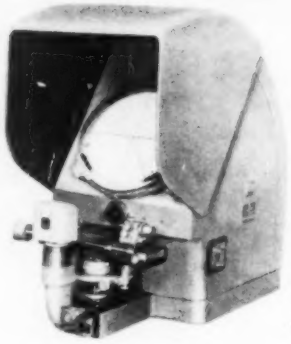


LENS—*Jones & Lamson Machine Co., Springfield, Vt.* Projection lens is used on the special blade-checking optical comparators for inspecting foil contours on turbine blades. The 434-mm. lens will take in a 6-in. dia. inspection area and project it at 5 magnifications on a 30-sq. in. screen. Lens aperture is 6⅝ in. in diameter.

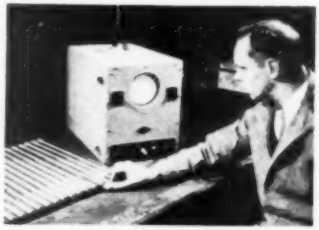


MICROSCOPE—*George Scherr Co., Inc., 200 Lafayette St., New York 12, N. Y.* Wilder toolmakers' microscope consists of a Meehanite base and post on which the microscope bracket is vertically adjustable. Microscope tube provides a standard magnification of 30x. Vertical post with microscope and bracket can be tilted for thread checking.

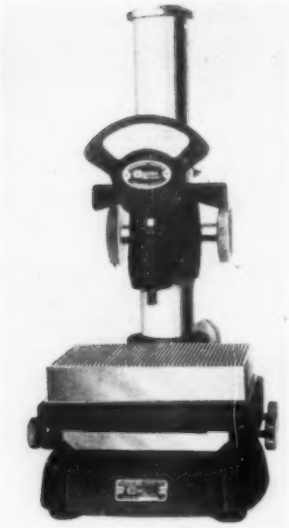
THREAD STAGING FIXTURE—*Engineers Specialties Div., The Universal Engraving & Colorplate Co., Inc., 980 Ellicott St., Buffalo 8, N. Y.* See-All thread staging fixture is for inspection by optical projection of screw threads ranging in diameter from 0.073 to 1.000 in. The universal-type fixture was designed for use with various types of comparators.



COMPARATORS—*Jones & Lamson Machines Co., Springfield, Vt.* Bench-type optical comparators and measuring machines are available in two models. The BC-7 model offers a choice of three table assembly combinations. Range of magnification is from 5 to 125. BC-14 model with 14-in. dia. screen offers four varied table assemblies. Range of magnification is 10 to 100.



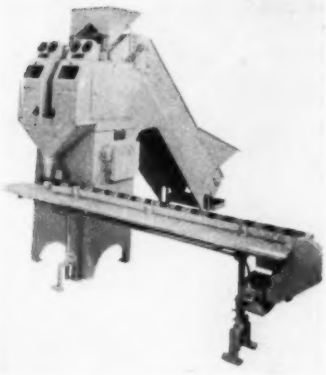
REFLECTOSCOPE—*Sperry Products, Inc., 1505 Willow Ave., Hoboken, N. J.* Type SR05 supersonic reflectoscope for non-destructive testing of metals and other materials for internal defects, and for testing welds, has redesigned circuits decreasing weight and bulk. Number of external controls has been reduced to five.



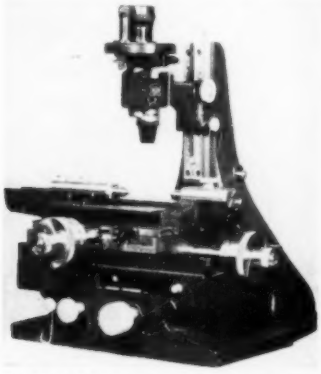
COMPARATOR—*Standard Gage Co., Poughkeepsie, N.Y.* Model 108 comparator is made for five interchangeable tables and the use of standard indicators, allowing a wide range of production and inspection measuring jobs.

THREAD COMPARATOR—*National Automatic Products Co., New Britain, Conn.* Swanson Thread Comparator for checking threads, consists of the stand with indicator and standard thread unit. A positive swing stop locates the anvil unit in correct reading position.

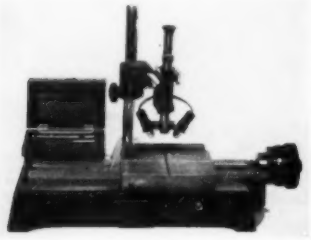
MAGNIFIER—*The Safety Center, 542 S. Dearborn St., Chicago 5, Ill.* Supersite magnifier is designed with an 8-in. lens and a 12-in. fluorescent lamp which circles the lens and provides illumination without a shadow at every point directly under the lens. Magnifier has a 7-in. field.



WEIGHER — *Triangle Package Machine Co., 906-92½ N. Spaulding Ave., Chicago 51, Ill.* High-speed Elec-Tri-Pak weigher handles small metal specialties such as bolts, mats, washers, and others. The machine is supplied with a low-waist high-gear hopper from which material is drawn by metal-cleated conveyor feed belts.



MICROSCOPE—*E. Leitz, 304 Hudson St., at Spring St., New York 13, N.Y.* Sagem toolroom microscope is for control, inspection and checking of profile gages, drill jigs, and other tools in addition to surface inspection. Table has a longitudinal traverse of 4 in. Microscope has a magnification of 30.

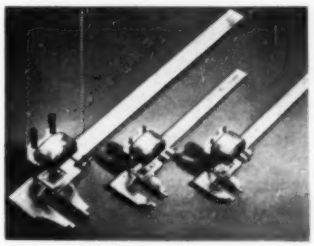


MICROSCOPE—*Boeckeler Instrument Co., 51 E. Rillito St., Tucson, Arizona.* Measuring microscope is for use in the mold shop or toolroom. Range of the microscope is nominally 10 in. Objects up to 7 in. high are accepted under the microscope objective.

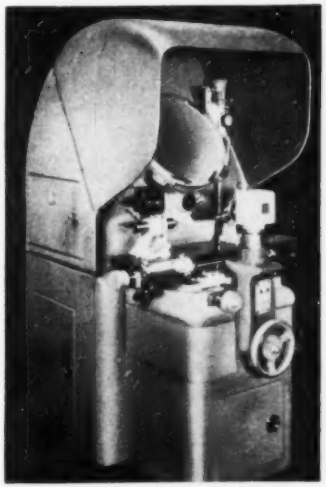
SOLDER TIN-CONTENT INDICATOR — *Wheelco Instrument Co., 847 Harrison St., Chicago, Ill.* Solder tin-content indicator checks for analysis of solder quality and provides a means of determining the ratio of the lead and tin content in solder. The direct-reading indicator consists of a high-resistance pyrometer and dual thermocouple extension.

POTENTIOMETER—*Meter and Instrument Div., General Electric Co., Schenectady 5, N. Y.* Portable potentiometer for precise measurement of very low voltages, checks temperature-measurement instruments, and tests rotating machines, ovens, furnaces, steam-driven equipment, and air-conditioning units. Potentiometer has two ranges, 0-60 and 0-6 millivolts.

COMPARATOR—*Sheffield Corp., Dayton, Ohio.* Method of checking the length of precision gage blocks exerts air pressure against the upper and lower surfaces. No gage-point contact exists. Comparator consists of a gaging unit and a Precisionaire base instrument with an amplification up to 40,000 to 1.



CAMERA—*Bausch & Lomb Optical Co., Rochester, N. Y.* Medium-size universal photomicrographic camera and accessories designated as Model L, produce a 5- by 7-in. negative with shutter speeds up to 1/50 sec.



COMPARATOR — *Jones & Lamson Machine Co., Springfield, Vt.* Heavy-duty pedestal model PET-14 comparator has a 14-in. dia. screen and a power-elevated table. Table can be compounded 20° either side of center, and has a 4-in. lateral travel. Objects to 8-in. dia. and 20-in. long can be inspected.

MAGNA-EYE — *Stebar Co., 711 W. Lake St., Minneapolis, Minn.* Magna-Eye for magnifying vernier scales on calipers and height gages is made in three sizes to fit Brown & Sharpe and Starrett calipers and height gages. Model 100 is made for 6-in. vernier calipers, Model 200 for 10-in. height gages, and 10-in. vernier calipers, and Model 300 for 18- and 24-in. height ◄—gages.

GAGE — *Cadillac Gage Co., 20315 Hoover Road, Detroit 5, Mich.* Portable 6-in. Pla-Chek gage designed for checking of small jobs is applicable for checking of gages, tools, and dies, either on the surface plate or at the machine. Accuracy is said to be to 0.00005 in.

MICROFILMING CAMERA—*Diebold, Inc., Canton, Ohio.* Flofilm 42-in. microfilming camera is designed to microfilm large or long tracings or maps while the copy is in motion. Listed as the 90-65 triple-purpose Flofilm camera, the machine can be used as a flow camera, enlarger, or printer.

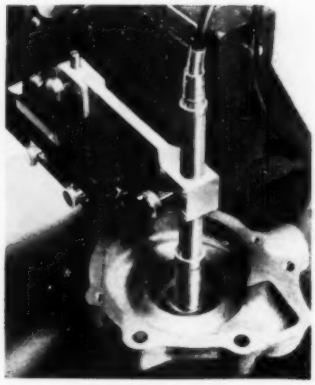
METROSCOPE—*Photocon Research Products, 1062 N. Allen Ave., Pasadena 7, Calif.* Ultrasonic device called the Metroscope automatically measures wall thickness of metal, plastic, and glass parts where only one surface is accessible, and also makes non-destructive tests to detect flaws in these materials. Thicknesses between 0.015 and 0.300 in. can be read directly.

PROFILOMETER AMPLIMETER TRACER — *Physicists Research Co., 321 S. Main St., Ann Arbor, Mich.* Tracer for use with Profilometer Amplimeters in taking surface roughness measurements on hard-to-reach surfaces, listed as Type GB tracer, provides for measuring in internal grooves and slots and tracing axially in small holes.

SURFACE-ROUGHNESS SCALE — *General Electric, Schenectady 5, N. Y.* Pocket-size surface-roughness comparator is for comparison, by sight and feel, with machine finishes. Scale is composed of two small metal rules 6 in. long and 1¼ in. wide, illustrating various degrees of roughness.

SURFACE-FINISH STANDARDS — *Edward Blake Co., 457 Cherry St., West Newton 65, Mass.* Machine-cut surface-finish standards are for surface quality control. The master set of surface-finish standards consist of 23 solid stainless-steel specimens, each having a machine-cut surface of predetermined-roughness value.

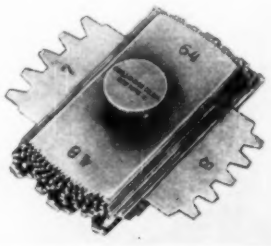
MAGNETIC BASES—*du Mont Corp., Greenfield, Mass.* Minute Man consists of an Alnico permanent-magnet base having a 40- to 50-lb. grip on all four sides. Interchangeable brass shafts, 7/32 in. in dia. and 5/6 in. in dia. are provided.



PROFILOMETER TRACER—*Physicists Research Co., 321 S. Main St., Ann Arbor, Mich.* Type GA Profilometer tracer for taking surface-roughness measurements on the bottoms of blind holes and on recessed flats and shoulders will measure in holes as small as 1 in. dia. and can be used for depths to 5½ in. Diamond point is self-adjusting to surface.

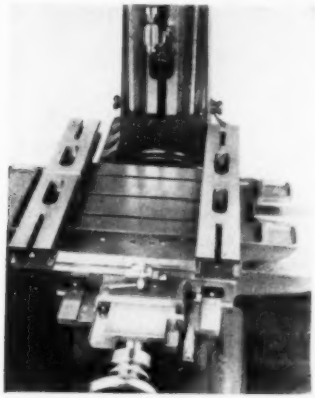
CALCULATOR—*Elemoto Sales Co., P.O. Box 62, Teaneck, N.J.* Calculator for addition and subtraction of fractions of inches, and inches and feet by mechanical means, is called the Elemoto Dimension Adder and Subtractor.

ABRASION TESTING SET — *Taber Instrument Corp., North Tonawanda, N. Y.* Model 100-109 Taber abraser standard testing set incorporates a rotary abrading action on a 4-in. specimen. The wear results from alternately rubbing the flat faces of two resilient Calibrase wheels over the surface being tested.



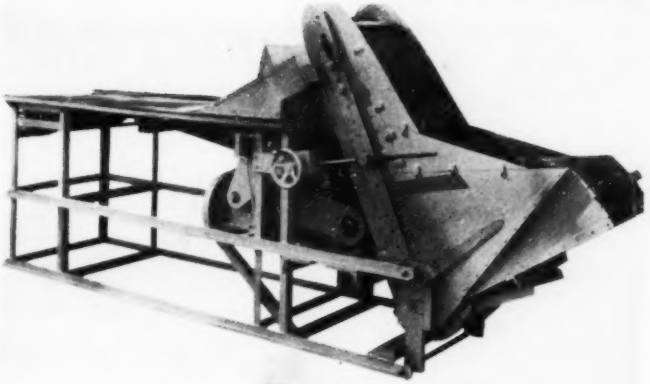
PAPER WEIGHT—*George Scherr Co., 200 Lafayette St., New York 12, N.Y.* Gear-gage paper weight also is a set of gear gages. Twelve leaves include 24 varied gear shapes of different diametrical pitches. Teeth are of correct involute shape.

PARALLELS—*The Lufkin Rule Co., Saginaw, Mich.* Adjustable parallels in sets, for layout, gaging, and checking work, can be adjusted to and locked to micrometer measurement and are adjustable to any size within the range of ¾ to 2¼ in. Thickness of all sizes is 9/32 in.

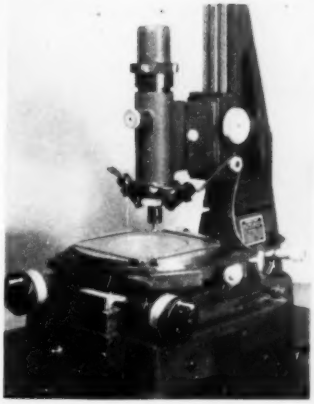


EXTENSION PARALLELS — *Moore Special Tool Co., Bridgeport, Conn.* Extension parallels for use with Moore jig borers and Moore jig grinders increase effectively table size. Offered in sets of four, they will accommodate work almost twice table size with no loss in accuracy of table settings.

STAGING FIXTURE—*Engineers Specialty Div., Universal Engraving & Colorplate Co., Inc., 980 Ellicott St., Buffalo 8, N.Y.* Gaging turbine blades by optical projection on a production basis is done with the Pant-O-Jector, a staging fixture that can be applied to the table of a standard optical comparator. It can check sides simultaneously or separately, of blades up to 3-in. chordal width and 6-in. airfoil length.



INSPECTION TABLE—*The D. H. Prutton Machinery & Tool Co., Cleveland, Ohio.* Inspection table has an elevator-hopper which feeds any small, mass-production item onto a 2x8-ft. conveyor belt for visual inspection. A multi-speed transmission and a variable-angle control allows any desired distribution on the table.



SPOTTING ATTACHMENT — *The Gaertner Scientific Corp., 1201 Wrightwood Ave., Chicago 14, Ill.* M2091SA2 spotting attachment is interchangeable with the standard optical system of the Gaertner Toolmaker Microscope. Attachment is used for laying out drill jigs, templets, and similar work requiring precision accuracy.

LEVELS—*Engis Equipment Co., 431 S. Dearborn St., Chicago 5, Ill.* Line of sensitive precision levels can be used for checking vertical and horizontal planes or can be incorporated into other instruments or equipment. Also offered is a line of instruments to determine and check angles or inclined surfaces called Clinometers.

STRAIGHT EDGE — *Herman Stone Co., 324 Harries Bldg., Dayton, Ohio.* Granite straight edge is said to be made to an accuracy of 0.0001 in. every 3 ft.

SURFACE PLATE — *The Herman Stone Co., 324 Harries Bldg., Dayton 2, Ohio.* Granite precision surface plate, 8x16 ft., is finished to a tolerance of 0.002 in. Plate weighs approximately 25 tons and can be used for checking stampings as long as 144 in.

PLATER'S COMPUTER — *Hanson-Van Winkle-Munning Co., Matawan, N. J.* The Jernstedt plater's computer determines plating time required to deposit a given thickness of any metal. Also determined are: current density required to produce a deposit of given thickness, thickness of deposit resulting from an established plating time at a known current density, etc.

ARCMETER—*The Arcmeter Co., 2016 Sixth St., Rockford, Ill.* Arcmeter, for drawing and checking radii as small as 20 in., listed as Model B, has a range of radii from 20 in. to infinity. A true arc can be determined by direct reading on the graduated scale. Model is 16 in. long by 3¼ in. wide and produces a 15-in. arc.

GRANITE STRAIGHTEDGE — *Rahn Granite Surface Plate Co., Dayton, Ohio.* A 6-ft.-long granite straightedge has edges made to a tolerance of 0.00005 in. Also offered are 90° granite angle plates made to the same tolerance as the surface plate.

Cleaning and Finishing

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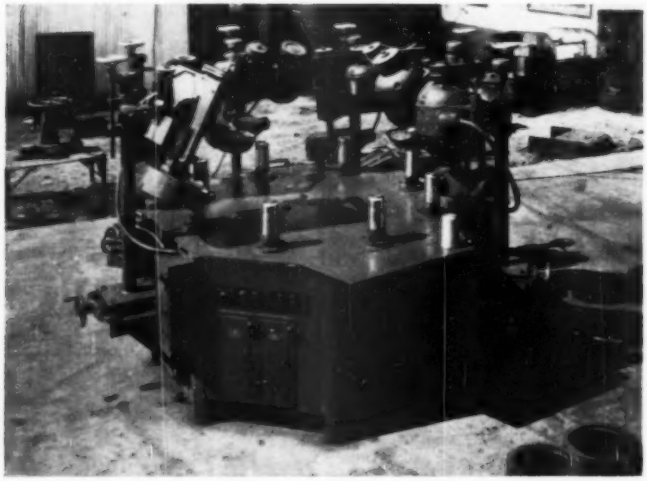
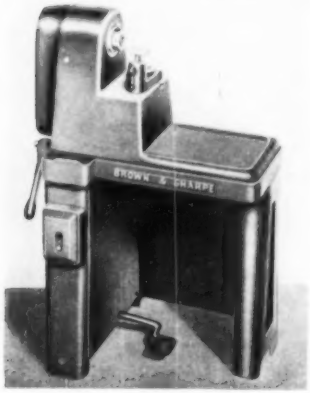
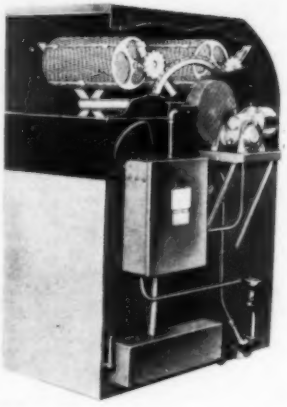


BUFFING MACHINE — *Square Deal Machine Co., South Gate, Calif., for Western Die Casting Co., Emeryville, Calif.* Automatic buffing machine designed to buff cylindrical objects from fountain-pen to eight-quart-pan size is said to be capable of treating from 120 to 2000 pieces per hr. Six buffing heads are separately controlled.



POLISHING, FINISHING MACHINE —*Brown & Sharpe Mfg. Co., Providence 1, R. I.* Polishing and finishing machine can be used for filing, burring and similar operations on small parts. Three spindle speeds, 4500, 3280, and 2380 rpm. are available.



TUMBLING ROTOMATIC — *Phillips Mfg. Co., 3475 W. Touhy Ave., Chicago 45, Ill.* Tumbling Rotomatic features conveyorized vapor-degreasing equipment. Parts when placed in a basket on the tumbling Rotomatic for degreasing, are tumbled eliminating cupping action and saving solvent.

BUFFER, POLISHER HEAD—*Vanott Machine Corp., 234 Colgate Ave., Buffalo, N. Y.* Automatic electrically powered buffing and polishing machine is said to be capable of finishing 800 parts per hr. Machine finishes small objects with diameters to 3 in., or up to 7 in. if only four spindles are used. Head indexes at pre-determined speeds.

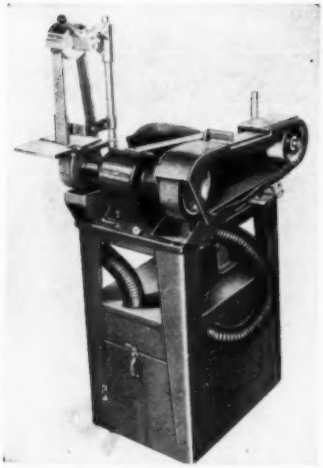
POLISHING LATHES—*Hanson-Van Winkle-Munning Co., Matawan, N. J.* Type MI and MS polishing lathes can now be supplied with a variable-speed arrangement. A handwheel permits speeds between 1800 and 3600 rpm. Spindle speed is governed by a variable-pitch motor pulley and a single, wide V-belt.

GRINDER POLISHER — *Hammond Machinery Builders, Inc., Kalamazoo 54, Mich.* Continuous-duty abrasive-belt grinder-polisher, Model 50-A, utilizes platen method for working into corners and grooves, chamfering and other operations.

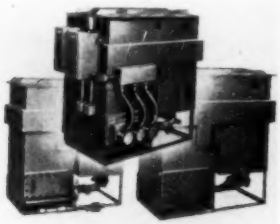
GRINDER - POLISHER — *Hammond Machinery Builders, Kalamazoo 54, Mich.* Flexible-belt grinder-polisher, Model VH-2, for abrasive belts 42 to 60 in. long and ½ to 2 in. wide, is used for fast grinding, polishing, shaping, deburring, and similar operations.

BELT AND DISK SANDER — *Atlas Press Co., 2304 N. Pitcher St., Kalamazoo, Mich.* A belt and disk sander handles long, short and wide stock, irregular shapes, edges and other types. The table can be used with either disk or belt. A 10-in.-dia. disk is used, a 4-in. belt, and a 7⅞x15-in. table. Belt speed is 1150 fpm.

TUMBLAST—*American Wheelabrator & Equipment Co., Mishawaka, Ind.* Continuous Wheelabrator Tumblast, for high-production blast cleaning, combines tumbling and longitudinal travel work. Parts are fed into and discharged from machine in a continuous flow.



GRINDER-POLISHER — *Hammond Machinery Builders, Kalamazoo 54, Mich.* Abrasive-belt grinder-polisher complete with built-in dust collector for grinding, polishing, chamfering, deburring and similar operations, can be used on metal, plastics, ceramics and glass. Machine will take wheel with straight sides to 2 in. wide; 3-in. width with recessed sides.



DEGREASER — *Detrex Corp., Detroit 32, Mich.* No. 625 degreaser is a two-dip hand-operated unit for cleaning of medium-size metal parts. The unit can be heated by steam, gas or electricity. It can also be furnished with combined gas and steam or gas and electric heating.

POLISHER, GRINDER — *Curtis Machine Corp., Jamestown, N. Y.* Straight-O-Matic abrasive-belt polisher and grinder, Model 600, allows feeding manually by coil unwinding and winding machines, or by conveyor or equivalent means. Abrasive-belt widths up to 10 in. are available. The infinitely varible feed is adjustable from 20 to 60 fpm.

PORTABLE ELECTRIC POLISHERS —*The Van Dorn Electric Tool Co., Towson 4, Md.* Improved portable electric polishers both standard and automatic models, have been redesigned. Polishers have had the gearing changed to a single-reduction spiral bevel gear similar to that now used on Van Dorn sanders.

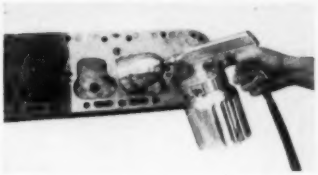
SPRAY GUN—*American Brake Shoe Co., Kellogg Div., 230 Park Ave., New York 17, N. Y.* Paint spray gun is called the Micro-Spray. Head can be removed as a unit by removing the locking screw and nut. Only one fluid needle is required for all paint spraying.

METAL CLEANING, FINISHING MACHINE — *Armstrong Chemical & Machine Co., Painesville, Ohio.* Jet Blast is for wet abrasive blast cleaning and finishing of metal surfaces. The machine removes rust scale and undesirable particles by projecting a slurry of fine abrasive suspended in water against the surface to be cleaned.

CLEANER—*Hartman Corp. of America, 5147 Natural Bridge Ave., St. Louis 15, Mo.* Portable electrically heated chemical cleaner for on-the-spot indoor cleaning of industrial machinery, conveyor systems and other equipment, as well as automotive maintenance work, eliminates smokestacks, flues and ventilators.

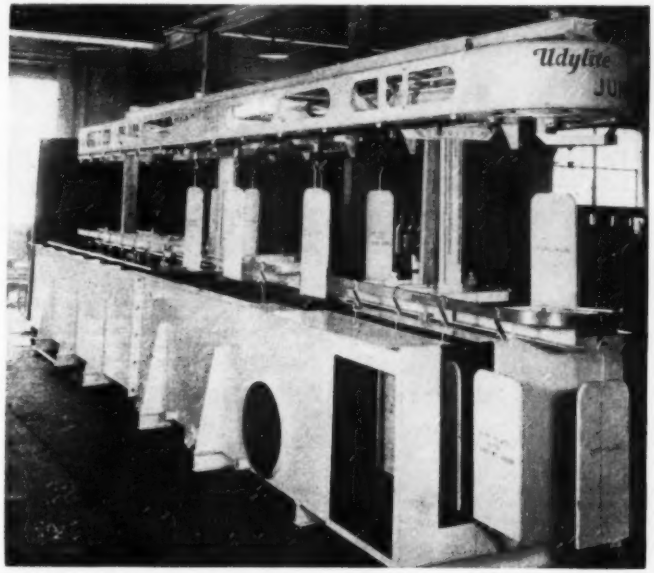
PRESSURE WASHER—*D & M Products, Inc., 4655 Kingswell Ave., Los Angeles 27, Calif.* Air and water pressure washer is a gun-type device controlling the mixture to penetrate and clean without harming the finish or back-splashing. Proportions of air and water can be adjusted.

PORTABLE CLEANER — *Livingston Engineering Co., 100 Grove St., Worcester 5, Mass.* Portable industrial steam cleaner includes a crusher nozzle with hand control. Hose and pressure tank are mounted on a steel dolly. Capacity is 28 kw.

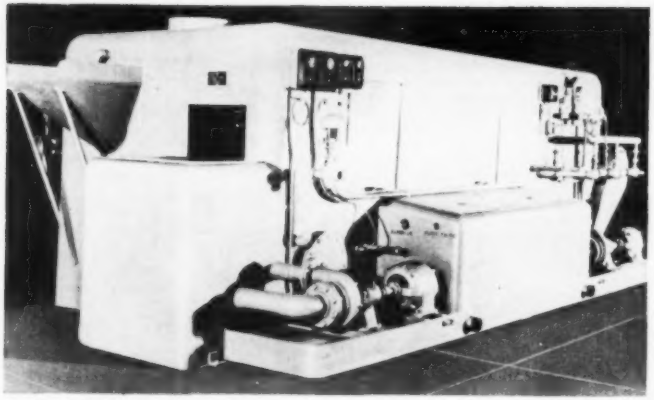


COMBINATION BLAST GUN—*Engineered Products, Inc., 1224 Speer Blvd., Denver, Colorado.* Tornado gun is an adaption of sand blasting and solvent spraying. It is air-operated and portable, and is said not to leave buffing marks, grooves or ridges.

WASHING METAL PARTS—*Magnus Chemical Co., Garwood, N. J.* Krazy-Dip cleaning machine for washing metal parts, requires manual labor only to load and unload. Mechanical agitation moves the parts into the cleaning solution 160 times a minute.



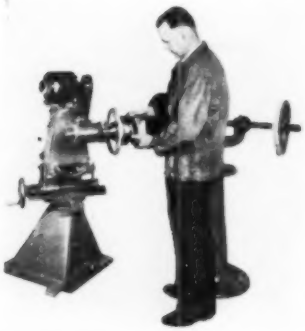
PLATING MACHINE—*The Udylite Corp., 1651 East Grand Blvd., Detroit 11, Mich.* Junior automatic plating machine has no conveyor chains and requires no electrical-timing-control panel. Machine handles 75 to 100 racks per hr., has nine stations: electroclean, cold rinse, acid dip, cold rinse, plate, cold rinse, hot rinse, dry, load and unload.



CONVEYOR CLEANER — *Cincinnati Cleaning & Finishing Machinery Co., Hecla St., Ironton, Ohio.* Combination drum and belt-conveyor wash, rinse and dry machine has loading hopper shown left, into which parts to be cleaned are fed. To the right is loading station for the belt conveyor parts.

AUTOMATIC FINISHING SYSTEM — *George Koch Sons, Inc., P.O. Box 358, Evansville 4, Ind.* Gyra-Flow automatic finishing systems are capable of two to 20 processes in any continuous sequence. A series of cylinders in sequence, each spirally wrapped with a variable number of turns of the conveyor belt, provides continuous rotation and agitation of air and liquid.

ABRASIVE-BELT HEAD — *Packer Machine Co., Meriden, Conn.* Head for automatic polishing and buffing is adaptable to most types of Packer-Matics. Unit has an interchangeable head, permitting various types of wheel applications as well as use of abrasive belts.



POLISHING MACHINE — *Vanott Machine Corp., 234 Colgate Ave., Buffalo 20, N.Y.* Electrically powered buffing and polishing machine, Type V-1, is designed to handle many different shapes as it is adjustable for height, angles, speed, and stroke up to 6 in.

WASHER — *Protectoseal Co., 1920 S. Western Ave., Chicago 8, Ill.* Automatic parts washer called the Air-Matic, offers fire protection in the use of flammable cleansing solvents. The Air-Matic is compact and portable. Washing is done by moving the perforated basket.

SEPARATOR — *Sturgis Products Co., Sturgis, Mich.* Roto-finish mechanical separator is a motor-driven unit for removal of parts from chips, or separation of mixed chips into various sizes.

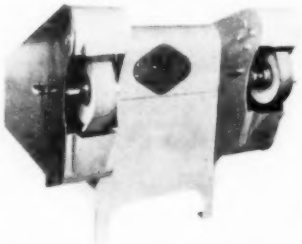
CLEANING UNIT — *Turco Products Inc., 6135 South Central Ave., Los Angeles 1, Calif.* Turco-Hydro-Steam unit can be used wherever a steam line pressure of 80 to 150 lb. is available. Weighing 28 lb., it is portable and can be disconnected.

FINISHING MACHINES — *Micromatic Hone Corp., Schoolcraft and Greenlawn St., Detroit 4, Mich.* Microflat machines for finishing flat surfaces are announced in a series of six models; two types, both using either bonded or loose abrasives, are offered. Machine finishes two opposite sides simultaneously.

TOUCH-UP PENCIL — *All-State Welding Alloys Co., Inc., 96 West Post Road, White Plains, N. Y.* Kromover touch-up pencil for rustproofing metal, regalvanizing spots, tinning bearings, and other tinning operations, will tin oil-impregnated bronzes, burned cast iron, all stainless steels, and the black iron, without removing mill scale.

DIPPING BASKETS — *Automotive Rubber Co., 8801 Epworth Blvd., Detroit 4, Mich.* Line of insulated baskets for dipping, pickling, and general use in submerging parts in corrosive solutions are fabricated of heavy-gage, reinforced, perforated steel with ⅛-in. thick, semi-hard pure rubber.

FINISHING MACHINE — *Sturgis Products Co., Sturgis, Mich.* One compartment Roto-Finish machine for small mechanized de-burring and finishing installations, listed as the CW-22-1 Model, 1x32 in. I.D., is equipped with a full-size, light-weight door.



POLISHING LATHE — *Crown Rheostat and Supply Co., 3465 N. Kimball Ave., Chicago 18, Ill.* Lathe, with two backstands and two exhaust hoods is known as the Bright Finisher. Side plates open for changing belts. Handwheel regulates tension of abrasive belt. Distance between wheels is 39 in. Unit takes abrasive belts to 6-in. wide.

BUFFING TOOL — *E. H. Bertram Engineering Co., 3034 Main St., Kansas City, Mo.* Buffing tool for polishing and sanding called the Bull buffer fits any chuck on an electric drill or flexible-shaft machine. Holding the drill stationary, buffer can be turned in a complete circle while in use.

Plant Service Equipment

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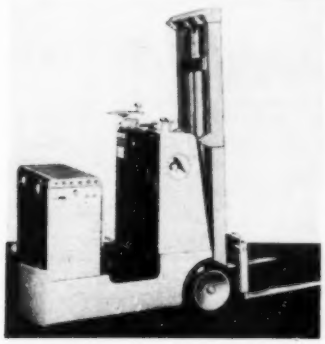
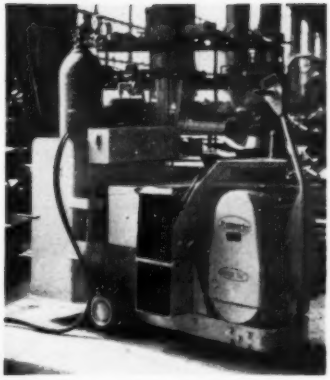
CRANE TRUCK—*The Elwell-Parker Electric Co., Cleveland 1¼, Ohio.* Type C-4 crane has a capacity of 3000 lb. with a 7-ft. radius.

FORK TRUCKS—*Clark Equipment Co., Clark Tructractor Div., Battle Creek, Mich.* Clipper fork trucks for high-tiering capacity has an over-all height of standard lift of 83 in. with forks lowered. Maximum tiering height is 124 in. Complete range of lift height varies from 72 to 132 in. Trucks have a lift capacity of 2000 lb.



FORK TRUCK—*Lewis-Shepard Products, Inc., 278 Walnut St., Watertown 72, Mass.* Electric fork truck has a 1000-lb. capacity. Model is available in both telescopic and non-telescopic models.



TRUCK — *Automatic Transportation Co., 149 W. 87th St., Chicago, Ill.* Electric transporter for carrying welding equipment is a battery-powered motorized hand truck. Called the Transwelder, it consists of a Transporter chassis, and a rack mounted with tanks, rods, tools and essential equipment for acetylene welding. The motorized truck pulls the electric welder.

TELESCOPIC WORKSAVER — *Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia 24, Pa.* The 120-in. tilting-fork model has a capacity of 3000 lb. The truck travels at 2 mph. under full load, lifts 8 fpm. with a 2500-lb. load, and tilts a full 18° in 10 sec.

OVERHEAD GUARD—*Lewis-Shepard Products, Inc., 276 Walnut St., Watertown 72, Mass.* Heavy-duty canopy-type overhead guard for power fork trucks is constructed of heavy tubular arc-welded steel and supported at four points on the fork truck.

ELECTRIC TRUCK—*Lewis-Shepard Products, Inc., 272 Walnut St., Watertown 72, Mass.* Electric fork trucks of 1500-lb. capacity are designed for loads of ½- to ⅝-ton. Truck is available in telescoping and non-telescoping models. The telescoping type has a collapsed height of 83 in., and a lifting height of 125 in.

ELECTRIC TRACTOR—*Lift Trucks, Inc., 2425 Spring Grove Ave., Cincinnati 14, Ohio.* Electric tractor to pull live and semi-live skids, Model KTL, has a wheel base of 40 in. The KTL is rated to pull a semi-live skid loaded with 4000 lb.

LOAD-MOBILE — *Market Forge Co., 25 Garvey St., Everett 49, Mass.* Rider-controlled electric lift truck called the Load-Mobile has folding step for operator for use when he continually must be on and off the truck. Two speeds are furnished, controlled by a pedal.

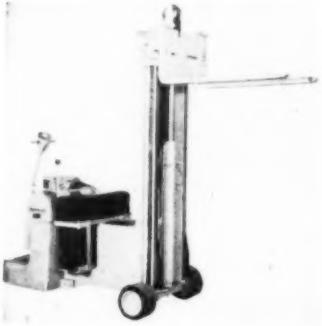
TRUCKS — *Yale & Towne, Philadelphia, Pa.* Fork trucks for low-headroom duty have short 68-in. mast height. The mast has a telescopic extension to permit high tiering. Truck is 58 in. long by 3 in. wide and has four forward and reverse speeds.

SKIDS—*Automatic Transportation Co., 149 West 87th St., Chicago, Ill.* Live, and semi-live skids can be handled by a special Transtractor. Full driving traction when lifting heavy loads is provided.

TRUCK — *Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia 24, Pa.* Worksaver, with a 4000-lb. capacity handles heavy dies and molds. Truck lifts it level with the lower platen of the press and mechanically loads it into position.

TRUCK—*Baker Industrial Truck Div., Baker-Raulang Co., 2168 W. 25th St., Cleveland 13, Ohio.* 2000-lb. fork truck for factories and warehouses where floor loading capacity is restricted and aisles are narrow has a weight with full load of only 5805 lb. It will take loads 36 in. long.

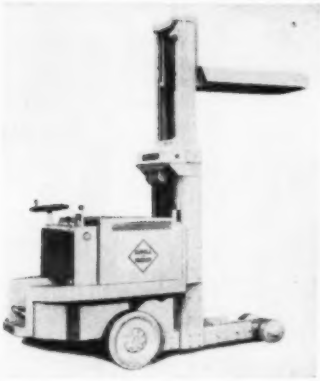
TRUCK — *Automatic Transportation Co., 149 W. 87th St., Chicago 20, Ill.* Fork truck, the Skylift Brawny, handles loads of 4050 to 8000 lb. The 4000-, 5000- and 6000-lb. trucks lift to 124 in., and have a standard collapsed height of 83 in.



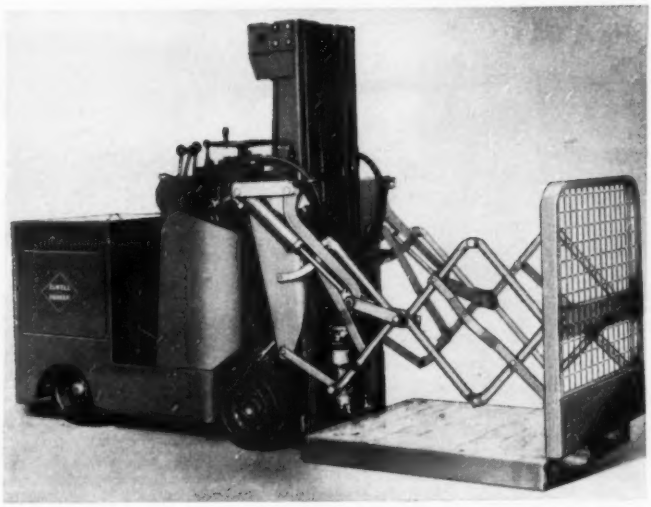
FORK TRUCKS — *Automatic Transportation Co., 149 W. 87th St., Chicago, Ill.* Suspended-fork model Transtacker has an automatic tilt at carrying position. Transtacker capacities 2500 lb. for a 36-in. load or 2000 lb. for a 48-in. load.

BOX-CLAMP ATTACHMENT—*Hyster Co., Portland 8, Oregon.* Box-clamp attachment for use with the Hyster Model 20 lift truck is adaptable to the standard • hydraulic-controlled Load-Grab, and includes box clamp arms for grasping the load.

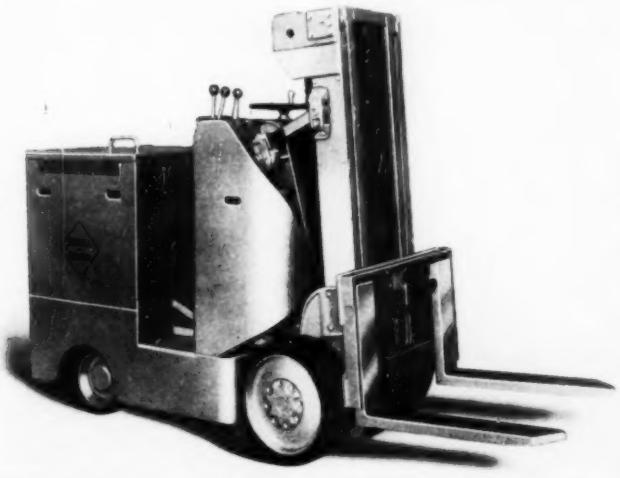
TRANSPORTER — *Automatic Transportation Co., 149 W. 87th St., Chicago 20, Ill.* Automatic Dual lift has a foot pump which reduces foot pressure necessary to lift loads into moving position or maximum height. Available in both foot-lift and electric-lift models in 4000- and 6000-lb. load-capacity platform models and 3000- and 4000-lb. capacity pallet models.



TELESCOPING HIGH-LIFT PLATFORM TRUCK—*The Elwell-Parker Electric Co., Cleveland 1½, Ohio.* Type ELN-6T truck has a capacity of 6000 lb.

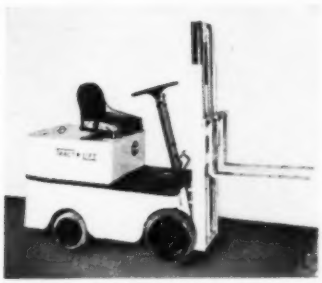


PALLET RETRIEVER—*The Elwell-Parker Electric Co., Cleveland, Ohio.* Power-truck pallet retriever is attachable to the forward end of a truck. A load-handling or stabilizing mechanism consists of two hydraulically actuated pantograph-type rams which terminate in a screen frame that remains in fixed position with respect to the load.

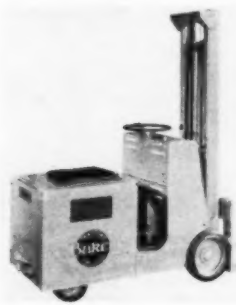


FORK TRUCK—*The Elwell-Parker Electric Co., Cleveland 1½, Ohio.* Telescoping fork-type truck, Type F-19T has a capacity of 6000 lb.

TRUCK—*Transitier Truck Co., 2477 N. W. 23rd Ave., Portland 10, Oregon.* Gasoline-powered fork lift truck comes in 1000- and 2000-lb. capacity models. The four-cylinder, water-cooled Cobra engine develops 26 hp. Truck has a welded one-piece body.

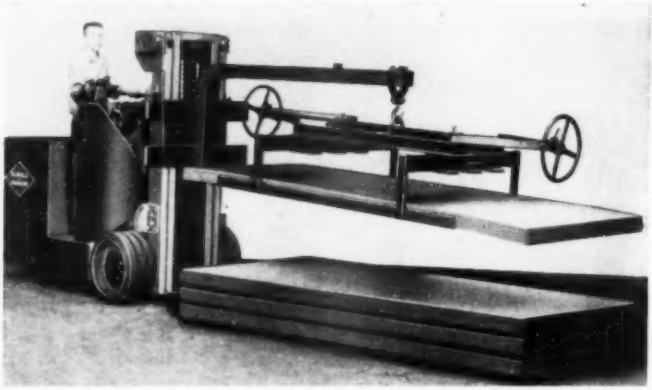


FORK TRUCK—*Tract-R-Lift Corp., 605 N. Aberdeen St., Chicago, Ill.* Compact gas-powered truck has a 2000-lb. capacity at 24 in. from heel of fork. Turning radius inside is 6 in.



TRUCKS—*Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia 24, Pa.* Additions to the line of lightweight low-capacity tilting-fork trucks are the 1000-lb., 1500-lb. and 2000-lb. models.

FORK TRUCK — *Baker Industrial Truck Div. of the Baker-Raulang Co., 2168 W. 25 St., Cleveland, Ohio.* Type FRH-20 center-control fork truck is designed for use on limited-capacity floors, congested areas, and similar applications. Capacity of the truck is 2000 lb., 36 in. long. Truck has a 42-in. ←wheel base.



TRUCK—*Elwell-Parker Electric Co., Cleveland, Ohio.* Steel plate and sheet handler utilizing the principle of counter-balancing effect of the truck, has a forward and backward tilt. Truck can stack steel 6 to 10 ft. high. Truck travels at 400 fpm. and elevates at 12 to 22 fpm.

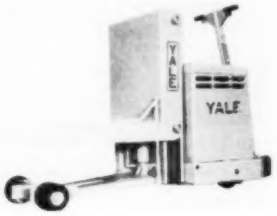
FORK TRUCK — *Baker Industrial Truck Div., Baker-Raulang Co., 2168 W. 25th St., Cleveland 13, Ohio.* Truck will handle loads up to 48 in. long. The truck is of compact design, equipped with no-plug full contactor control with four-speed automatic time-delay acceleration. ↓

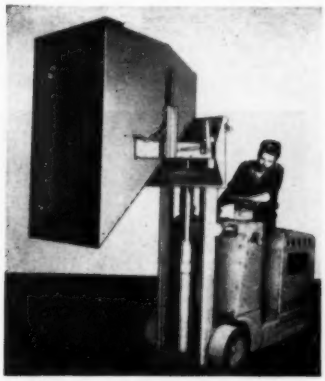
ATTACHMENT—*Automatic Transportation Co., 149 West 87th St., Chicago, Ill.* Twin pusher attachment for handling metal drums can be used on standard Skylift electric fork trucks of all capacities. The hydraulic unit contains its own motors and pumps.

HIGH-LIFT TRUCK—*Yale and Towne Mfg. Co., Philadelphia, Pa.* Low-cost, high-lift Worksaver electric pallet truck is a battery-operated truck with 2500-lb. capacity. Over-all dimensions are 39x31 in. not including the forks. Pallets can be lifted 66 in. for overhead tiering.

TRUCK—*Moto-True Co., 1953 E. 59th St., Cleveland, Ohio.* The redesigned 2500-lb. capacity 12-v. Hi-Lift counter-balance motorized hand-operated Walkie truck is built in three types: a 66-in. non-tilting, 66-in. with tilting mast, and 80-in. telescopic with tilting mast, 20° backward and 2° forward ← in collapsed position.

TRUCK — *Yale & Towne Mfg. Co., Philadelphia Div., 4530 Tacony St., Philadelphia, Pa.* Platform Worksaver lifts 13-in. to handle diversified skid sizes. The battery-powered hand truck can handle skids ranging in height from 6 to 18 in. Truck has a capacity of 6000 lb. →

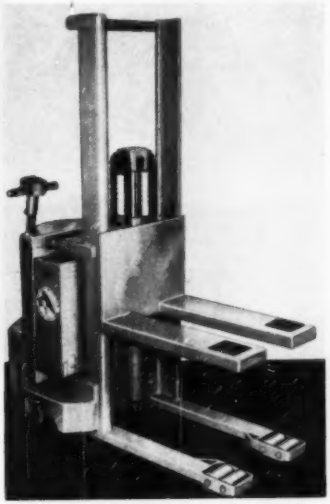




HOPPER ATTACHMENT — *Lewis-Shepard Products, Inc., 282 Walnut St., Watertown 72, Mass.* Self-dumping hopper attachment has been developed for their gas and electric power fork trucks. Operation of the hopper is controlled from seated position.

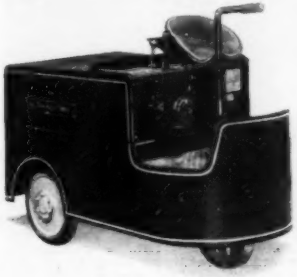
STRADDLE TRUCK — *Hyster Co., Portland 8, Oregon.* Improved Model M Straddle Truck, has an 18,000-lb. capacity. It replaces a 12,000-lb. truck, but retains the same size by a revised main frame structure and a new hoist clutch arrangement. Visibility from the driver's seat has been improved.

HYDRAULIC LIFT TRUCK—*Ross Carrier Co., Benton Harbor, Mich.* Series 5 truck has a 2½-ton capacity. It is gasoline powered by a four-cylinder, 25-hp. engine.

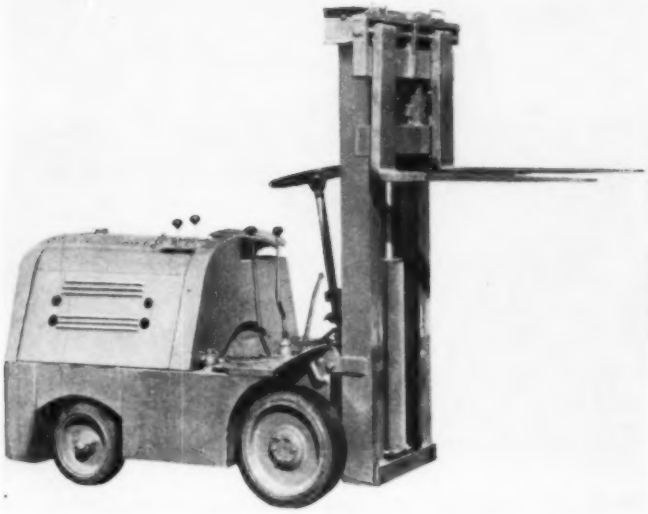


POWER-DRIVEN JACKSTACKER—*Lewis-Shepard Products Inc., 285 Walnut St., Watertown 72, Mass.* Truck in capacities up to 4000 lb. is available in four models: counterweighted and straddle type for double-faced pallets; open-end base with lifting arms for single-faced pallets; and platform type for skid platforms.

CAB — *Clark Equipment Co., Battle Creek, Mich.* Weather-tight cab for driver protection can be installed on Yardlift-40 and Yardlift-60 models. The cab has a roof window of glare-proof plastic to provide visibility for high tiering.

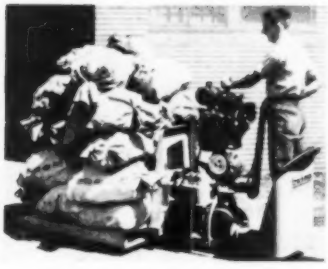


TRACTOR — *Mercury Mfg. Co., Chicago 9, Ill.* Electric Tractor, offered to meet moderate industrial-haulage requirements, listed as Model A-560-5, is 70x34 in., and has a light-running speed of 6.5 mph. The standard power source is a low-type, 36-v., battery of 300-amp. hr. capacity.



LIFT-TRUCKS—*W. F. Hebard & Co., 536 W. 37th St., Chicago 9, Ill.* First of series of Fork Lift trucks to be added to the Buda-Hebard Line is the Model F-50 Shop Mulift. The truck has a 5000-lb. capacity rated at 20 in. from the heel of the forks with a telescoping lift of 110 in.

CHORE BOY—*Buda Co., Harvey, Ill.* Model FH platform-type Chore Boy is available in an improved model. The new model has a deck-loading area of 20 sq. ft. In addition to the standard pedal brake, an automatic brake applies itself whenever the operator leaves the seat. ↓

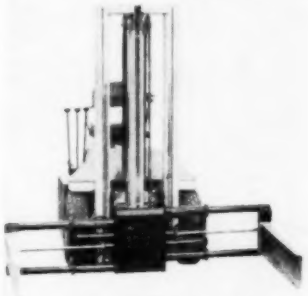


FORK TRUCK—*Clark Equipment Co., Industrial Truck Div., 258 Champion St., Battle Creek, Mich.* Yardlift No. 60 pneumatic-tired fork truck offers a 6000-lb. capacity. Standard lift is 112 in., with an over-all height of 85 in. →

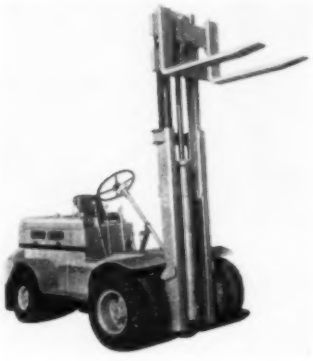
TRUCK—*Truck-Man, Inc., 1424 Gaxson St., Jackson, Mich.* Pallet-handling truck, the Truck-Man pallet toter, listed as Model DF, is a gasoline-powered pallet toter with a capacity of 3000 lb. Speeds in either direction ←– are from creeping up to 3 mph.

TRUCKS—*Yale and Towne Mfg. Co., Philadelphia, Pa.* Line of gasoline-operated trucks, said to be of radical design, will be available in capacities up to 6000 lb., and the high-lift types will tier to 130 in.

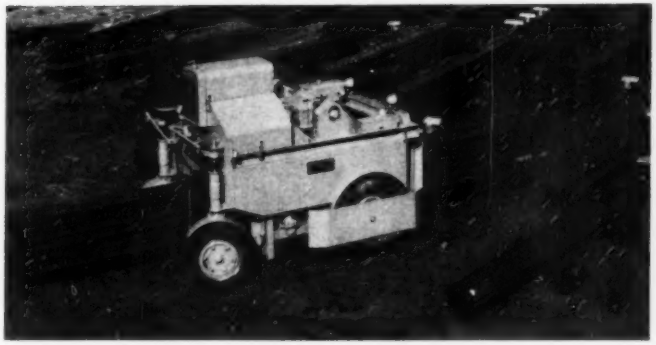
PRIME MOVER—*Bell Aircraft Corp., P.O. Box 1, Buffalo 5, N.Y.* The materials-handling device has a 1000-lb capacity and the ability to climb a 20% grade with full load. Called the Prime Mover, the three-wheeled machine is powered by a 3-hp. air cooled engine.



TRUCK ATTACHMENT—*Hyster Co. Portland 8, Ore.* Hydraulic attachment the Load-Grab, has steel arms designed for squeeze-carrying of bales, boxes, barrels, or oil drums without pallets. Attachment is used with the Hyster No. 20, No. 40 lift trucks. It has a capacity of 1780 lb. on the Model 20 and 3350 lb. on the Model 40.

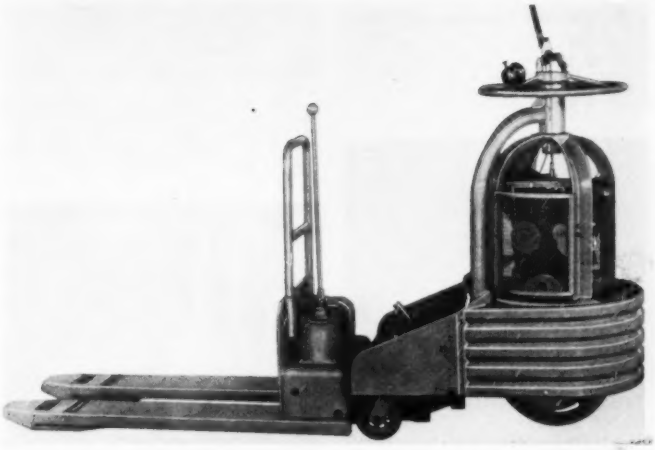


STRADDLE CARRIER—*Ross Carrier Co., Benton Harbor, Mich.* Straddle carrier, Series 70, has 10,000-lb. capacity. It is powered by a 6-cylinder gasoline engine rated at 65 hp., at 2800 rpm. Hydraulic hoisting mechanism is provided. →



HYDRAULIC TRUCK—*Mixer-mobile Manufacturers, 6855 N.E. Halsey St., Portland 16, Ore.* Wagnermobile Lift, heavy-duty unit enables handling of 6000 lb. to 8 ft., 4000 lb. to 11 ft. It turns inside a 6¼-ft. radius. Unit weighs 7425 lb.

HAND TRUCK—*Keen Mfg. Co., 801 Dogwood, Harlingen, Texas.* Relationship of handles and toe plate is adjustable on this hand truck. Pressing the pedal releases the mechanism so the handles can be adjusted to the desired angle.

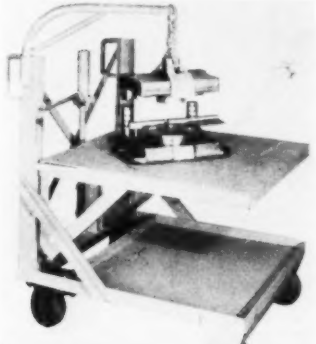


TRAILER—*Mercury Mfg. Co., 4114 S. Halsted St., Chicago 9, Ill.* Industrial trailer of all-steel construction has a capacity of 15,000 lb.

TRUCKS — *Schwitzer-Cummins Co., 1145 E. 22nd St., Indianapolis 7, Ind.* Line of gasoline-powered trucks have 3000-lb. capacity. Two models are equipped with hydraulic pumps for lifting the load on pallets or skids. A third has a fixed platform.

PALLET TRUCK—*Handling Devices Co., Inc., 581 Boylston St., Boston, Mass.* Improved Jack-O-Might pallet truck is a hydraulic low-lift truck of 2000-lb. capacity.

TRUCK — *Palmer-Shile Co., 16019 Fullerton Ave., Detroit 27, Mich.* Box-type hand truck of all-steel construction handles light parts. The truck features four pneumatic tires.

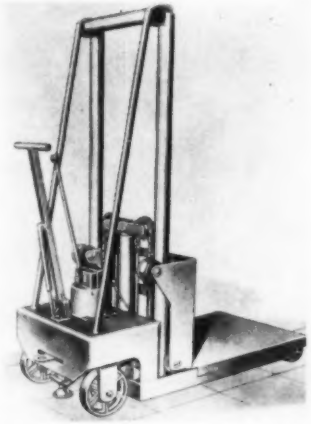


DIE, MOLD TRUCK—*Wellington Machine Co., Wellington, Ohio.* Hydraulically operated die and mold truck has a capacity of 1000 lb.

LIFT TRUCK—*Lyon-Raymond Corp., 4438 Madison St., Greene, N.Y.* Single-stroke lift truck for use with skid loads to 2500 lb. has 8-in.-dia. front-wheels. Unit offers a 180° operating radius, and pushbutton action to engage the lifting device.

HAND PALLET TRUCK—*Sherman Industries Div., Sallinger-Sherman, Inc. 138 Brookline Ave., Boston 15, Mass.* Hydraulically-operated hand-pallet truck called the Jack-O-Might, has a capacity of 2000 lb. Truck is said to be tested to 10,000-lb. static capacity, and is operated by a standard hydraulic jack unit. Truck has a lift of 2½ in.

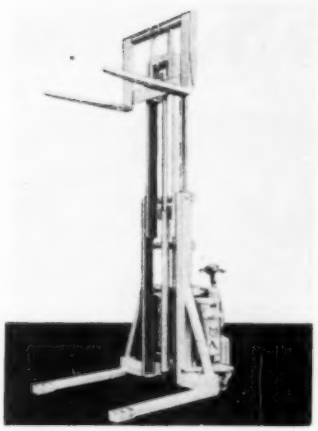
TRUCK—*Lyon-Raymond Corp., 4542 Madison St., Greene, N.Y.* Tote-pan lift truck with a capacity of 600 lb., has open forks to engage the side handle or lip, and lift load by a downward push of operating handle. Automatic lock holds load in elevated position.



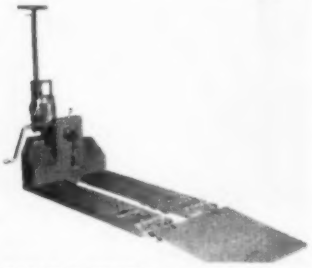
HIGH-LIFT TRUCK—*Lyon-Raymond Corp., 4230 Madison St., Greene, N.Y.* Truck with four-wheel suspension, auto steer towing eye, and 3600-lb. capacity has a 30x36-in. platform supported by concave rollers. Platform has a range of elevation from 6 to 54 in.

DIE-HANDLING TRUCK — *Lyon-Raymond Corp., 6312 Madison St., Greene, N. Y.* 3000-lb. capacity hydraulic lift truck is furnished with boom and chains for die separating. Die-handling truck incorporates a boom which extends 36 in. The 30x36-in. platform has a range of elevation from 6 to 54 in.

TRUCK—*Rapids-Standard Co., Inc., Dept. F-122, 342 Rapistan Bldg., Grand Rapids 2, Mich.* Heavy-duty platform truck, The Freighter is available in 7 platform sizes, with truck weights varying from 167 to 242 lb. Capacity of the truck depends on the type of wheels employed and varies from 2960 to 6000 lb.



TRUCK — *Lewis-Shepard Products, Inc., Watertown, Mass.* Telescopic Jackstacker capacities to 4000 lb. Truck is electrically operated, and designed for the movement and high stacking of materials on skid platforms, pallets, or in sectional bins.



PALLET TRUCK — *Lyon-Raymond Corp., Greene, N. Y.* Hydraulic pallet truck fitted with winch and ramp is adaptable for handling heavy cases weighing up to 6000 lb. Case is drawn up the ramp and on truck platform by means of winch and cable. Winch is furnished with 15 ft. of steel cable.

FEEDER-CONVEYOR — *Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.* Oscillating feeder and conveyor handles materials in a horizontal path. The PA conveyor is an eccentric-type oscillating-trough feeder-convevor, driven by a Link-Belt Electrofluid drive. It is available in standard trough widths of 12 to 48 in. in single trough lengths of up to 100 ft.

CONVEYOR—*Island Equipment Corp., 27-01 Bridge Plaza North, Long Island City 1, N. Y.* Reversible, portable, roller, gravity conveyor allows handling of packages that are wider than the frame. Cases to 24-in. wide can be carried. Sections are 10-ft. long and 90° curves.

BELT CONVEYOR—*Mar-Rail Conveyor Co., 56 York Ave., Pawtucket, R. I.* Flo-Table stock-model steel-belt conveyor is assembled with stock parts. Belt widths, 6 to 36 in., in 2-in. multiples are used. Lengths of 100 ft. or more, 10- to 100-lb. per ft. capacity are available.

CONVEYORS — *Sermat Conveyor Corp., 2350 W. 58th St., Chicago 26, Ill.* Flex-E-Unit steel-belt conveyors are composed of a head, or drive section and takeup section at opposite end. Each section is 5 ft. long. Basic arrangement can be lengthened to 175 ft. Widths are offered in 4 sizes from 12 to 36 in.

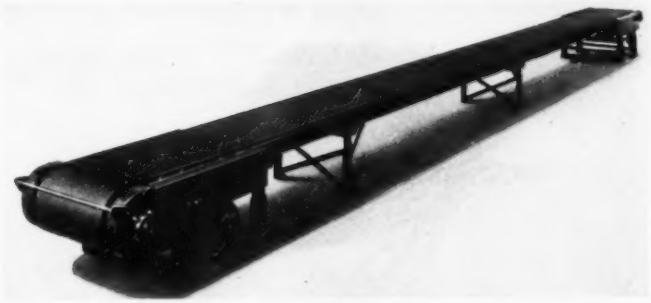
BOOSTER—*Island Equipment Corp., 27-01 Bridge Plaza North, Long Island City 1, N.Y.* Portable belt-conveyor booster, the Styl-O-Veyor, is capable of being fed or discharged from either end. Angle or height is adjusted by hydraulic power. Width of the unit inset is 16½ and 26½ in.

CHAIN CONVEYOR—*Island Equipment Corp., 27-01 Bridge Plaza North, Long Island City 1, N. Y.* Method of chain conveyor installation requires no return chain when a loop conveyor is utilized. The power unit and a takeup unit can be installed in the conveyor line at the beginning of the operating cycle to obtain the driving power.

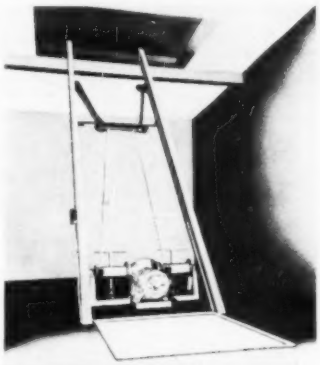
FLIPSWITCH—*Speedways Conveyors, Inc., 1261 Niagara St., Buffalo 13, N. Y.* Conveyor switch for connecting a spur to a conveyor line, the 45° Flipswitch is connected to standard gravity conveyor sections and is operated by rotating the switch section of conveyor.

STEEL BELT—*May-Fran Engineering, Inc., 1710 Clarkstone Road, Cleveland 12, Ohio.* Hinged-type steel belt for handling hot forgings, bolts, nuts, and steel scrap can also be used as a quench-tank conveyor. The belt is made of ⅛-in. steel hinges with 4-in. pitch and 3/16-in. thick steel hinges with 6-in. pitch.

CONVEYOR — *The Rapids-Standard Co., Inc., Dept. FJ-114, 342 Peoples National Bank Building, Grand Rapids 2, Mich.* Standardized multi-purpose power belt conveyor, the Floor-Veyor, Jr., is designed for moving medium weight loads between floors or horizontally, and is built in lengths which are mutliples of 2½ ft., up to 30 ft.



BOOSTER—*Sage Equipment Co., 30 Essex St., Buffalo 13, N. Y.* A 15-ft. portable booster can be raised and lowered at each end by a handwheel. It is built with a 24-in. wide, 3-ply, solid woven-cotton duck belt, and floor locks.



AUTOMATIC STAIRWAY LIFT—*Moto-Flow Co., Bay City, Mich.* The Stairlevayor handles materials between different floor levels. It is adjustable for width, length and pitch of stairway, and can also be used as a lift over present wood or concrete stairway.

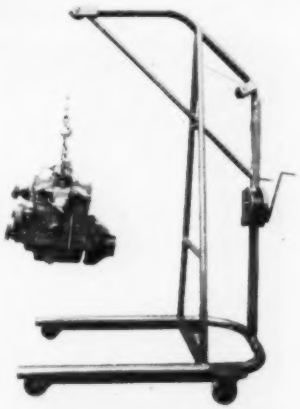
CONVEYOR — *Sage Equipment Co., 30 Essex St., Buffalo 13, N. Y.* Inclined floor-to-floor conveyor of the sliderbed construction with nosed-over delivery and power-driven tail feeder is built with an 8- to 24-in. wide, 3-ply, 28-oz. duck ruff-top rubber-covered belt.

HOIST-JACK—*Coffing Hoist Co., Danville, Ill.* Hoist-jack for various operations which require a hoist, a jack, or a load binder weighs 13 lb. It is built to lift or pull 2000 lb. Operation is by a ratchet and pawl operated by a handle.

CONVEYOR BELT — *Hewitt Rubber Division, Hewitt-Robbins, Inc., Buffalo 5, N. Y.* High-tension fabric conveyor belt called Raynile is offered for jobs where belt tensions run as high as 1000 lb. per in. of width. The woven fabric is a combination of rayon and nylon.

BELT CONVEYOR—*Rapids-Standard Co., Inc., Dept. P-21, 342 Rapistan Building, Grand Rapids 2, Mich.* Power-belt conveyor, "Power-Veyor", built for permanent installation is available in belt widths of 8, 12, 14, and 20 in. It is said to be suited best to fill the need for a horizontal conveyor in lengths up to 150 ft.

CONVEYOR — *Rapids-Standard Co., Inc., Grand Rapids 2, Mich.* Stevedore, Jr., applicable as a portable stacker-booster in a gravity conveyor line, or as a horizontal belt conveyor, is available in lengths of 11, 13½, and 16 ft., with either 10- or 16-in. wide belt.



CRANES—*The Grand Specialties Co., 3155 W. Grand Ave., Chicago 22, Ill.* Portable shop cranes are available in three models. The No. 1-C with a lift up to 7 ft., and the No. 2-C with a maximum lift of 10 ft. 8 in. is guaranteed for 400-lb. lift.

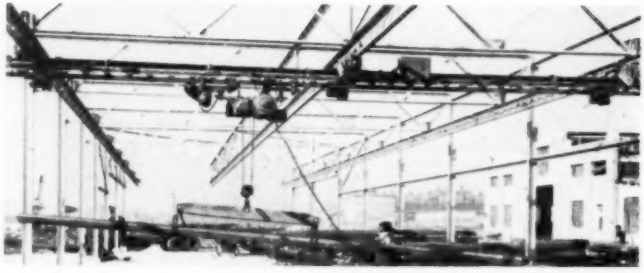
CRANE—*Thew Shovel Co., Lorain, Ohio.* The Wide-Track TL-20 Self-Propelled Crane has a lifting capacity without outriggers when operating on rubber of 18,000 lb. at a 10-ft. radius. It travels at speeds up to 7 mph.

PULLER—*Coffing Hoist Co., Danville, Ill.* Mighty Midget puller pulls or lifts 500 lb. Chain has tensile yield of 2000 lb., and its snap hooks, a tensile yield of 3000 lb. A safety-load handle is designed to bend at a load of approximately 800 lb.

CRANE — *The Hydro-Lift Crane as offered by Cardinal Corp., St. Paul, Minn.* Crane has a 2000-lb. capacity and a 45-in. boom. An 18-in. extension arm can be attached for greater boom length.

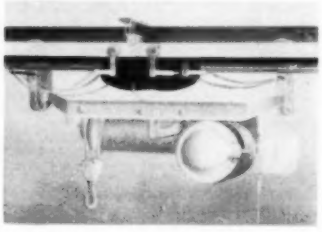
CRANE—*Steels Engineering Products Ltd., Sunderland, England; distributed by Coles Cranes, Inc., 4312 South Paulina St., Chicago, Ill.* The smallest crane, Model 8506, 1¾-ton mobile crane is powered by a Ford 4-cyl. gasoline engine. The generator has a nominal rating of 3 kw. at 2000 rpm.

HEAVY-DUTY CHAIN HOIST—*Chisholm-Moore Hoist Corporation, Tonawanda, N. Y.* Model M aluminum hoist is available in capacities from ½ to 10 tons. The one-ton model weighs 35 lb.



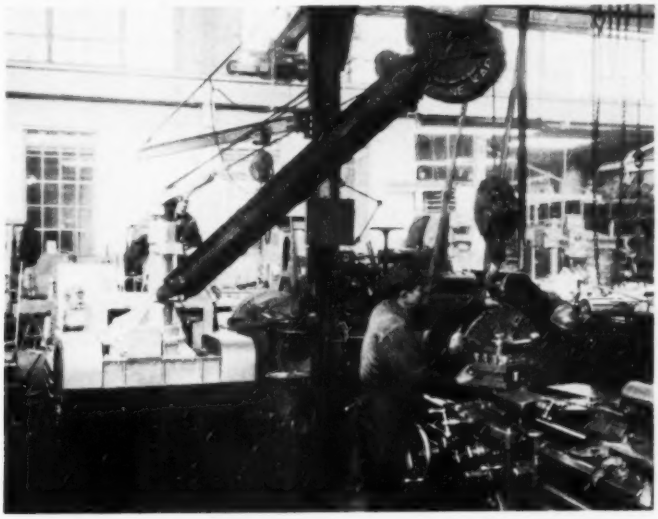
TRAMBEAM CRANE—*Whiting Corp., Harvey, Ill.* Crane and Monorail System has automatic hoisting, racking and interlocking mechanisms.

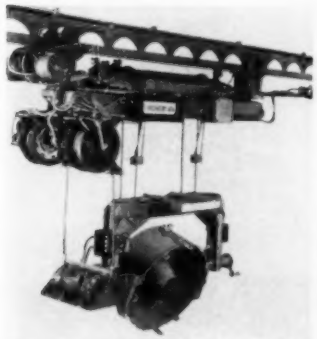
OVERHEAD CRANE TROLLEY—*Euclid Crane & Hoist Co., Euclid 17, Ohio.* 5-ton electric overhead crane trolley has improvements including inclosed gearing, ground shafting, roller bearings and double brakes. With a 12-in. drum and four parts of 7/16-in. cable, it has a lift of 40 ft. at a speed of 40 fpm.



MONORAIL HOIST—*Benbow Mfg. Co., Box 589, Redwood City, Calif.* Method for supplying electric current to monorail hoists virtually eliminates the danger of accidental contact with the conductor. Called the Trac-Troly System, it operates on the principle of the caterpillar tread on a tractor.

TROLLEY CONVEYOR—*Smith Power Transmission Co., 1545 E. 23rd St., Cleveland, Ohio.* FlexoiD overhead-cable-type trolley conveyor, with a roller chain-type driving sprocket, permits trolley spacing to 1¼-in. increments. It will operate in a horizontal plane, 45° max., and rise or dip in a vertical plane.





OVERHEAD CARRIER—*The Cleveland Crane and Engineering Co., Wickliffe, Ohio.* Automatic carrier was developed for transporting baskets of various metal chips from an oil extractor to any one of a number of storage bunkers. The carrier delivers, empties by turning the basket over, and returns automatically without help of the operator.

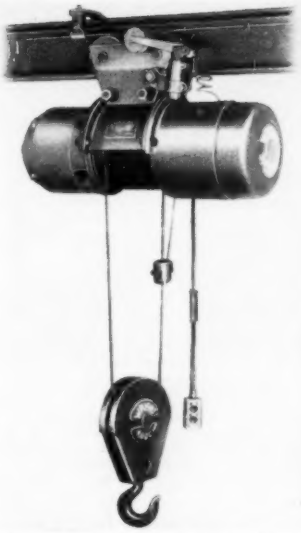
LIFTING MAGNETS — *The Cutler-Hammer Inc., 205 N. 12th St., Milwaukee 1, Wis.* Capsule-coil-construction lifting magnet is encased in a metal welded capsule from which moisture is removed by a vacuum process prior to impregnating coil with an insulating compound under pressure.

HOISTS—*Ford Chain Block Div., American Chain & Cable Co., Inc., York, Pa.* Line of electric hoists named Whippet with pushbutton control can be furnished with trolleys, either parallel or cross mounted, and supplied for hook suspension, or rigid or bolt suspension. Capacities range from 250 to 2000 lb. Standard lift is 12 ft.

EQUALIZING SLING—*The Caldwell Co., 1850 Camp Ave., Rockford, Ill.* Improved model of the Adjust-A-Leg equalizing sling is designed to lift odd-shaped and unbalanced loads level or at predetermined angle. Their capacities range from ½ to 12 tons, with a safety factor of five.

TROLLEY—*Saginaw Products Corp., 8 A River St., Saginaw, Mich.* Improved chain-hoist trolley for use on I-beam overhead conveyor installations have standard grease fittings supplied for positive pressure gun lubrication. Grease seals hold lubricant and exclude dust and grit.

AIR HOIST—*Keller Tool Co., Grand Haven, Mich.* One-ton capacity air hoist is known as Model 86-2V20. Hoists feature variable speeds which are said to give operator full control of positioning, lowering, or raising of load at desired speed from creep to 17 fpm.

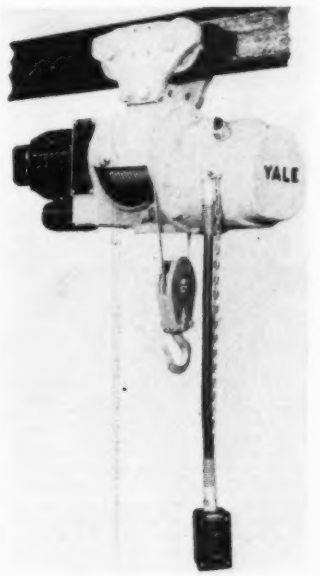


HOISTS — *Wright Hoist Division, American Chain and Cable Co., Inc., York, Pa.* Line of electric hoists in capacities from 1,000 to 20,000 lb. is of all-steel construction with preformed cable and swaged cable fittings.

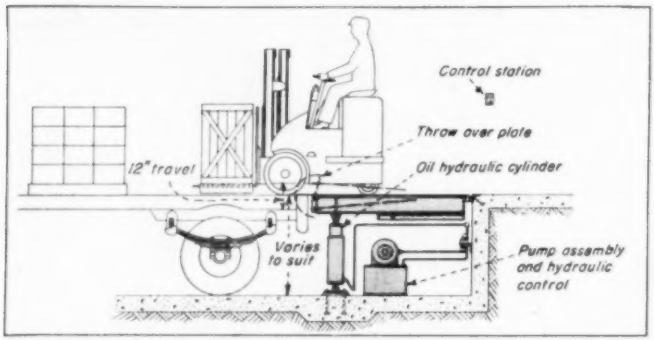
CRANE-CAB COOLER—*Dravo Corp., Fifth and Liberty Ave., Pittsburgh, Pa.* Small air conditioning unit for factories working with such materials as aluminum, copper, lead, manganese, and magnesium works in plant temperatures up to 130 F.

HYDRAULIC CRANE UNIT—*Day-Smith Hydraulic Crane Corp., Camp Hill, Pa.* Mobile hydraulic unit, the Lugger crane, lifts and carries to 6000 lb. Ten feet of vertical boom travel, with a cable travel of 16 ft., is provided as well as an 18½-ft. max. clearance under the hook.

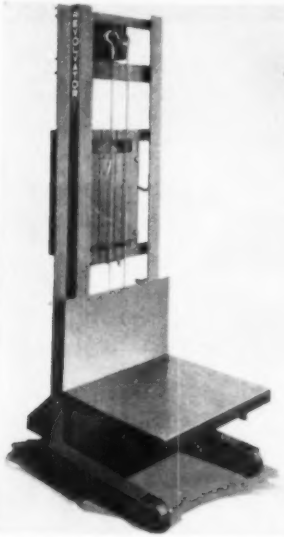
MOBILE CRANE—*Silent Hoist & Crane Co., Brooklyn 20, N. Y.* For operation in extremely close quarters the Model AJ crane car has 1½-ton capacity. It is 51 in. wide, 82 in. high, and has an 11-ft. turning radius.



HOIST—*Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia 24, Pa.* A line of low-capacity, wire-rope hoists, known as the Load King, are available in ¼-, ½-, and 1-ton capacities. The frame is a one-piece, ribbed-steel casting, constructed for use with lug, plain-trolley, motor-trolley, or winch-type mounting.



HYDRAULIC EQUIPMENT—*Rowe Methods, Inc., 1753 E. 25th St., Cleveland, Ohio.* Line of hydraulic equipment maintains horizontal alignment between a shipping or receiving dock and the trucks or trailers being loaded or unloaded. This is accomplished by adjusting the truck to the dock or the dock to the truck.



PORTABLE ELEVATOR—*Revolvator Co., North Bergen, N. J.* Lightweight hand-operated portable elevator is known as the Uplifter. It weighs 415 lb., and has a turning radius of 45 in. The over-all height of the machine is 77 in. and the height of lift is 62 in. The Uplifter has a 24-sq. in. platform.

DRAWER UNITS—*Hamilton Mfg. Co., Two Rivers, Wis.* Drawer units offer a 3-sided drawer pull on the shallow drawer unit only, guarding against pinched fingers. An attachment clinching the rear hood to the bottom drawer is introduced into the 5-drawer unit.

STEEL SHELVING—*Tri-State Metal Products, Inc., Box 1513, Pittsburgh 30, Pa.* Steel shelving can be assembled to form a variety of units. Basic parts consist of four posts with 36- or 24-in.-wide shelves either 12, 18, 24, or 36 in. deep. Posts are available in heights of 87, 84, 48, 45, and 39 inches.

SCALE—*Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia 24, Pa.* Five-ton scale is for suspension between crane hook and loads. This set-up eliminates lost time and motion when rehandling loads before and after weighing.

PALLETS—*Elizabeth Iron Works, Inc., Box 360, Elizabeth B, N. J.* All-steel pallet with self-contained collapsible stacking attachment can be loaded with odd-shaped merchandise and then stacked by the attachment. The stack capacity is 20,000.

MAGNESIUM DOCK BOARDS—*Magline, Inc., Inconning, Mich.* They are of welded construction and are custom made to fit all requirements.

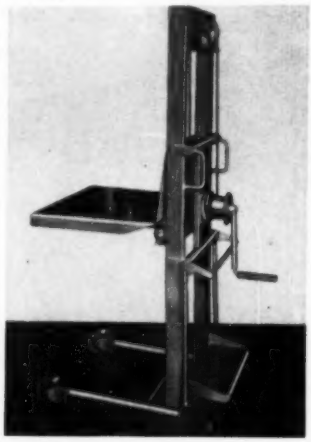
PALLETS—*Kerlow Steel Flooring Co., 222 Culver Ave., Jersey City 5, N. J.* Line of steel pallets, built of grating bars set on edge for strength, are designed for lift by a fork truck at any of the four sides or four corners. All corners are rounded. Pallets are available either plain or with closure.

DRAWERS—*Bay Inc., 30 N. 16th St., Philadelphia 32, Pa.* Adjustable-compartment shelf drawers for handling and storing small parts are slotted to accommodate dividers.

WOOD PALLET—*Wood Pallet Co., Inc., 332 E. 149th St., New York 51, N. Y.* Wood pallet is for use with four-forked, pusher-type lift trucks. Palletized loads can be picked up with the pallet, or the load can be taken without the pallet for shipment.

PALLET—*Addison-Semmes Corporation, 1800 Thurston Ave., Racine, Wis.* Expendable pallets are built using any combination of corrugated paper board decks glued to round corrugated paper posts. They are made in single- or double-faced types for four-way fork entry.

PORTABLE ELEVATORS—*Montgomery & Co., Inc., 53 Park Place, New York 7, N. Y.* Type C portable elevator is available in all capacities for both hand and electrical operation and with various size platforms and heights. Elevator has a capacity of 750 lb.



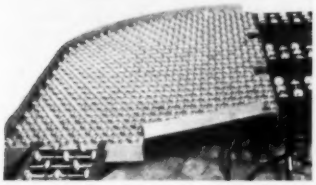
HOISTER — *Lewis-Shepard Products Inc., Watertown, Mass.* CH Handy Hoister, a light-weight, rugged stacker has Crank-up-crank-down operation through planetary gear-drive winch for placing and holding platform at any level. Hoister is available in a standard size of 500-lb. capacity, having a 24x24-in. lifting platform.

TABLE — *Lyon-Raymond Corp., 4808 Madison St., Greene, N. Y.* Elevating table, hydraulically operated, and without the regular top for special applications requiring an adjustable pedestal is capable of handling 2000-lb. loads. Platform elevates from 28 to 44 in.

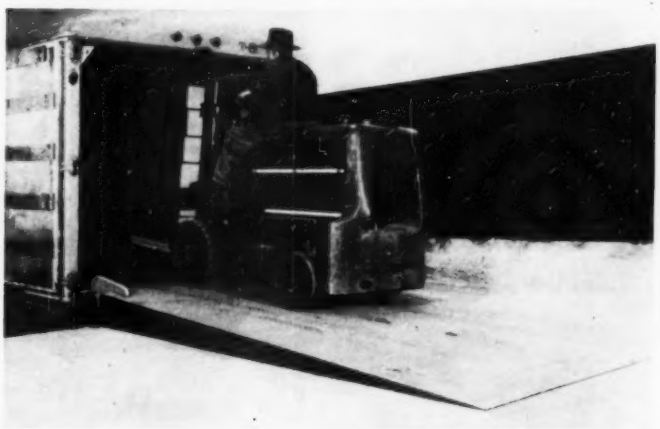
SHEET-FEEDING TABLE—*Lyon-Raymond Corp., 6154 Madison St., Greene, N. Y.* A 10,000-lb. capacity hydraulic elevating sheet-feeding table has a 16-in. range of elevation. Known as the Model 66 table, the top is 36 in. wide by 66 in. long.

SHEET-FEEDING TABLES — *Lyon Raymond Corp., 4434 Madison St., Greene, N.Y.* Two models of the hydraulic sheet-feeding tables, the 4000-lb. and 6000-lb. capacity tables, are available in a synchronized dual-pedestal design. A 30° tilt top is optional.

PALLET—*Pacific Chain & Mfg. Co., 4200 N.W. Yeon Avenue, Portland 10, Oregon.* Skeleton pallet with a steel semi-open framework design can be loaded or unloaded by fork trucks. Pallet handles 55-gal. drums measuring 48x48 in.



TRANSFER TABLE—*Sage Equipment Co., 30 Essex St., Buffalo 13, N. Y.* Ball transfer table handles all types of packages and cartons with flat bottoms. Construction allows handling of loads to 10,000 lb.



BOX—*Palmer-Shile Co., 16019 Fullerton Ave., Detroit 27, Mich.* Corrugated box with legs for moving or storing heavy metal parts has legs designed to permit complete accessibility with fork or power-lift truck.

BOX—*Palmer-Shile Co., 16019 Fullerton Ave., Detroit 2, Mich.* Square stacking box is designed for handling miscellaneous parts. Box with an all-steel welded construction has a four-way entrance with a corrugated bottom.

SKID—*Palmer-Shile Co., 16019 Fullerton Ave., Detroit 27, Mich.* All-steel corrugated skid, for handling heavy industrial loads, offers an all-welded construction, and can be used with power-lift or hand-operated trucks.

SKID—*Palmer-Shile Co., 16019 Fullerton Ave., Detroit 27, Mich.* Skid made of steel designed for handling heavy loads, and is equipped with removable end racks to facilitate loading and unloading.

SHELF BOX—*Bay Inc., 30 N. 16th St., Philadelphia 32, Pa.* Boxes for storing bolts, nuts and other small parts are equipped with label holders on front for identification of contents, and come in a variety of sizes.

TOOL WORKSTAND—*Bay Inc., 30 N. 16th St., Philadelphia 32, Pa.* Tool and work stand made with heavy-gage steel shelves furnished with choice of two or three reversible shelves, is 30 in. high without casters. Other dimensions are 30x18 in.

WIRE-ROPE SLING—*Palmer-Shile Co., 16019 Fullerton Ave., Detroit 27, Mich.* Wire-rope sling is made of improved plow-steel. Two 6-in. loops are spliced in and sewed with tape. Slings are offered in four, ⅛-in. rope diameters from ⅜ to ¾ in., in 6-ft. lengths.

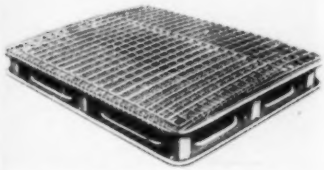
PALLET AND RACK COMBINATION—*Material Handling Equipment Co., 30 Church Street, New York 7, N. Y.* Uni-Rak multi-purpose pallet and rack combination for high tiering has capacities to 4000 lb. It fits all standard pallets up to 48x54 in.

STORAGE BIN — *Palmer-Shile Co., 16019 Fullerton Ave., Detroit 27, Mich.* All-steel storage bin, designed with a 4-way entrance for use with a hand, power-lift or fork truck, can be tiered with a portable elevator, high lift or fork truck. Inside dimensions are 36x36x24 in.

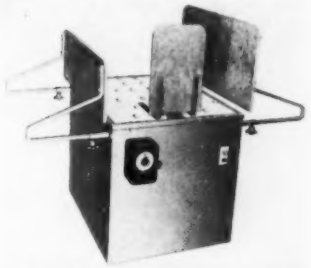
DRUM, BARREL TILT—*Palmer-Shile Co., 16019 Fullerton Ave., Detroit 27, Mich.* Drum and barrel tilt is designed for simplification of materials handling and the elimination of hand dumping. Unit has two safety-type locking devices. Barrel can be turned 360°.

HOPPERS—*The Gordon L. Hall Co., Old Lyme, Conn.* Adjustable-feed stacking hoppers, Type B, are flexible in arrangement, and are furnished in five sizes varying in capacity from 30 to 250 cu.in. Bins have gravity feed.

HYDRAULIC DEVICE—*Rotary Lift Co., 1054 Kansas St., Memphis, Tenn.* Hydraulic device adjusts loading docks to truck bed heights. The "Leva-Dock" is a hinged platform supported by a hydraulic jack. Ramp has a capacity of 20,000 lb.

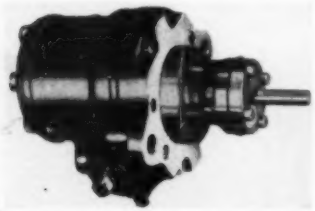


PALLET BOX—*Monroe Auto Equipment Co., Monroe, Mich.* Collapsible pallet box, and a line of accessories for pallets, platforms, skids, and boxes are offered. Pallet box utilizes an all-steel, 40x48-in. pallet as a base. Capacities range from 2500 to 5000 lb. in single loads, and 15,000 to 35,000 lb. in tiered loads.

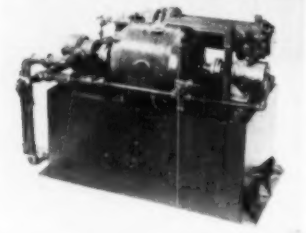


COUNTER, STACKER — *Superior Punch Press Co., 3610 Superior Ave., Cleveland, Ohio.* Automatic counter and stacker will count objects from a production line up to a speed of 200 pieces per min., stack them in piles, and then transfer the counted stacks to the conveyor system. Each stack is electrically counted.

HOPPER—*Stackbin Corp., Pawtucket, R.I.* Adjustable hopper with a sliding front is said to prevent the overflowing or jamming of parts. Its opening can be made smaller or larger according to necessity.

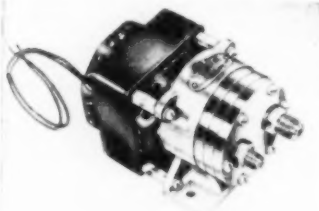


PUMP — *Polo Pump Co., Polo, Ill.* Model 15 pump is designed for direct motor drive at 1725 rpm. and pressures up to 150 psi. It will make a suction lift up to 25 in. of mercury. Capacity is 50 gallons per hr.



PUMPING UNITS — *The Universal Hydraulic Machinery Co., 285 Hudson St., New York 13, N. Y.* Dual pumping units are available in all sizes and combinations from 12-40 gpm. at 250 psi., and from up 1.25 to 5 gpm. up to 5000 psi.

REPRIMING PUMP—*Ruthman Machinery Co., Cincinnati, Ohio.* The Rumaco Model R repriming pump unit is designed for pumping out dirty cutting oils or coolants from machine-tool sumps. Capacity is 4 gpm. at 15-ft., and 15 gpm. at 3-ft. difference in level from suction nozzle to discharge level when equipped with 10 ft. of suction and 10 ft. of discharge hose.



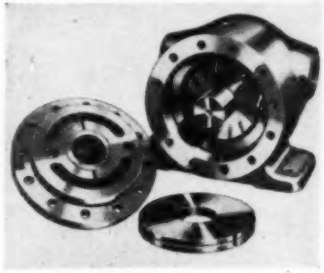
METERING PUMP — *Mechanical Products Corp., 168 North Ogden Ave., Chicago Ill.* The uniformity with which the motor-driven unit discharges the liquid is not affected by a wide change in temperature or viscosity.

GEAR PUMP—*Hydraulic Equipment Co., 1100 E. 22nd St., Cleveland 17, Ohio.* Hydraulic gear pump requires only four capscrews for assembly. The assembly bolts are located close to the outside diameters of the gears, and well within the high-pressure area of the pump.

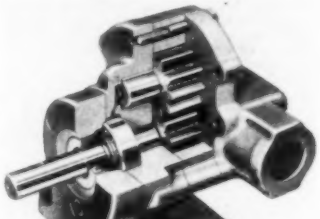
CIRCULATING PUMP—*J. J. Sieten Co., 5631 Lauderdale, Detroit 9, Mich.* Circulating pump for multiple spray-gun installations provides liquid buffing and polishing compounds to revolving wheels at the proper pressure for each gun.

SWASHPLATE PUMP — *Messrs. Oswald & Ridgway, Ltd.; offered by B. J. Grigsby, 120 South La Salle St., Chicago 3, Ill.* Beacham hydraulic swashplate pump contains neither connecting rods, slipper, nor universal joints, the reciprocation of the plungers being obtained by direct contact between them and a single swashplate. Capacities range from 0.11 U.S. gpm., on the SWO-0 pump to 3.3 U.S. gpm. on the SWC-10 pump.

PUMP—*Sundstrand Machine Tool Co., Hydraulic Div., Rockford, Ill.* Constant-displacement, hydraulically balanced pump for continuous duty at 1000-psi., operating pressure comes in capacities ranging from 2 to 75 gpm. with three sizes covering the complete range.

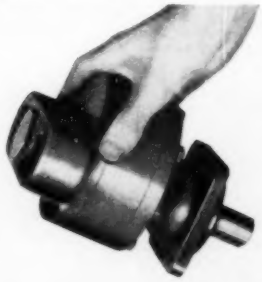


PUMP—*Racine Tool & Machine Co., Hydraulic Div., Racine, Wis.* Adjustable-volume vane-type oil hydraulic pump for use in limited space, called Model J, can be installed in an area as small as 6x6 in. A volumetric efficiency of 90% is said to be maintained at 1000-lb. pressure.

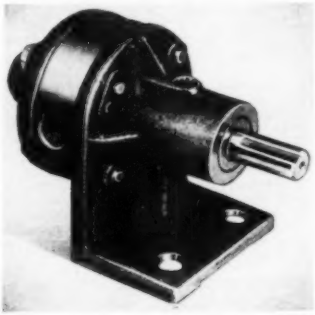


OIL PUMP—*Adel Precision Products Corp., Burbank, Calif.* Gear-type hydraulic oil pump is available in various models with rated capacities at 1800 rpm. from 1.5 to 60 gpm. Designed for 1000-psi. service, pumps can be had in a variety of mountings.

HYDRAULIC PUMP—*Lyon-Raymond Corp., 5816 Madison St., Greene, N. Y.* Power-operated hydraulic pump will deliver 1½ gpm. of oil, and develop a pressure of 1000 psi. Reservoir has an oil capacity of 2½ gal. The entire pump assembly is 18¼ in. high and 12½ in. in diameter.

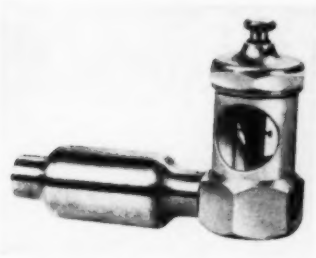


PUMP—*Sundstrand Machine Tool Co., Rockford, Ill.* Constant-volume pump for 1000-psi. service is made in 8 capacities ranging from 3 to 10 gpm. at 1200 rpm. Unit features a Rota-Roll pumping-member design. The smaller roller or inner member is keyed to a shaft and drives outer member at a speed 25% lower than speed of motor.

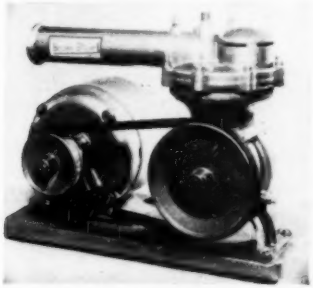


PUMP—*Ellipse Corp., 4140 N. Kedzie Ave., Chicago 18, Ill.* Rotary pump, series C-175 offers discharge accomplished by mechanical action of vanes and rotor, as well as by centrifugal force. Unit eliminates need for belts and pulleys. Pump capacities ½ to 4 gpm. at 125-psi. working pressure, and comes in foot, flange, and sump mounts.

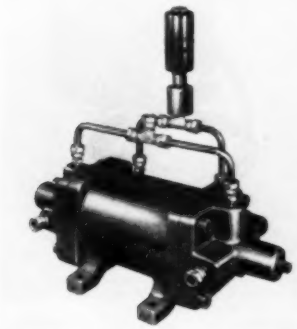
COOLANT PUMPS — *Allis-Chalmers Mfg. Co., Box 512, Milwaukee 1, Wis.* Two seal-less type coolant pumps, a vertical submerged and a side-wall mounted unit, are of the low-head, single-stage type close-coupled to the motor.



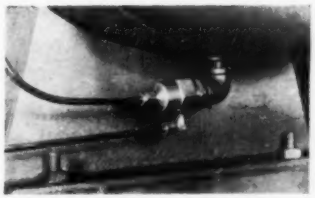
LUBRICATOR, FILTER—*Jarett Compressor & Equipment, Inc., 275 Central Ave., Newark 4, N. J.* Combination lubricator and filter, the Lubri-Filter, designed for compressed-air lines, is said to protect air-driven equipment against "dry-running" breakdowns and impurities in the air supply.



AIR COMPRESSORS—*Kellogg Div., American Brake Shoe Co., 230 Park Ave., New York 17, N. Y.* Two portable fractional-hp. air compressors eliminate contact or contamination of the air with lubricating oil. Both compressors are adjustable for different pressures. Model 8-C, illustrated, delivers 2.2 cfm. at 25-lb. pressure.



INTENSIFIER—*Elmes Engineering Works of American Steel Foundries, 1002 Fulton St., Chicago 7, Ill.* Air-actuated, continuously charging intensifier, the Power-petuator, provides a continuous high-pressure stroke and maintains any desired pre-set ram pressure on small hydraulic presses. Capacity is 50 tons pressure. Suggested applications include molding plastics and rubber, laminating and force assembly.



WATER UNLOADER—*A. Shelburne Co., 739 Ceres Ave., Los Angeles, Calif.* Automatic water unloader removes all water and oil from the air-compressor tank. Called Landsdale water unloader, device is designed to fit any electrically operated air compressor which is equipped with a centrifugal or magnetic unloader.

AIR COMPRESSOR—*The Grimes Co., Dallas, Texas.* Vertical air compressor is designed with the tank upright and the motor and air-compressor unit mounted on top. Three models are offered. The Model 25-V has a 20-gal. tank with a 1½-cfm. air displacement.

AIR-CONVERSION UNIT—*Paragon Metal Products, 844 W. Adams St., Chicago 7, Ill.* The air-conversion unit is designed for converting hand-operated arbor presses into air presses. The air-conversion unit has a 4-in. I.D. cylinder, a 2½-in. stroke, and a ¾-in. ram.

AIR SEPARATOR—*The Chicago Mfg. & Distributing Co., 1928 W. 46th St., Chicago 9, Ill.* The model E air separator delivers clean, dry steam, gas and air. Model E has a maximum rated capacity of 250 cfm., a 2-in. dia., is 15-in. high, and has a 1½-in. standard pipe connection.

AIR RECEIVERS — *Dayton Rogers Mfg. Co., Minneapolis, Minn.* Air receivers manufactured in sizes from 9- through 170-gal. capacity, will handle all gases and liquids under pressures up to and including 200 psi. They are furnished with a certified code tag.

DRAFTSMAN'S TRAY — *Winslow Product Engineering Corp., 614 S. Maple Ave., Los Angeles 14, Calif.* Draftsman's tool tray, a combination of rack and tray designed for triangles, rulers and other drafting materials, holds curves and triangles upright.

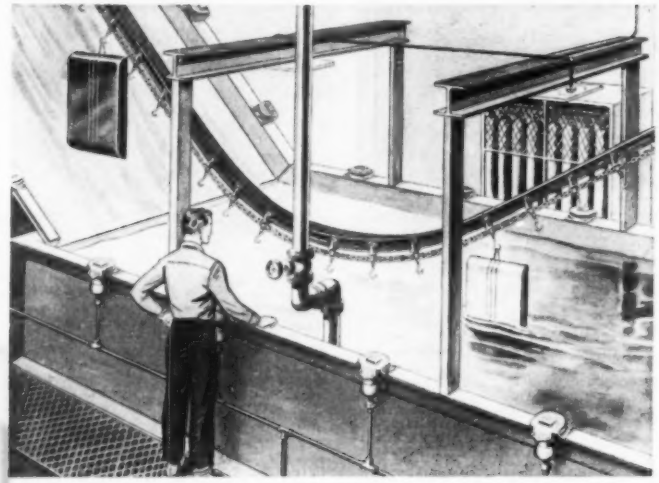
WHITEPRINTER — *The Charles Bruning Company, Chicago, Ill.* Model 21 BW Whiteprinter, continuous in operation, exposes and develops cut sheets or roll stock up to 42-in. width—any length.

AIR COMPRESSORS—*The Air-Flo Compressor Co., Akron, Ohio.* Air compressor uses 18 principal parts to construct a line of 48 different models of 1-, 2-, 3-, 4-, or 6-cylinder pumps in single- or two-stage types. Interchangeability permits carrying a small basic inventory of replacement parts. Compressors are available in sizes from ½ to 40 hp.

BLUEPRINT MACHINE—*Ozalid Div., General Analine and Film Corp., Johnson City, N. Y.* Super B blueprint machine accommodates materials up to 42 in. in width. Dimensions are 84½ in. wide, 78 in. high, and 38 in. deep.

T-SQUARE—*Instrumaster Industries, 2456-34 West Jackson Blvd., Chicago 12, Ill.* T-Square is a one-piece shatterproof plastic model. The clear plastic permits visibility of the surface on which the T-Square is placed. Both sides of the T-Square are usable.

PRINTING, DEVELOPING MACHINE—*Reproduction Products Co., 12790 Westwood Ave., Detroit 23, Mich., together with Economy Blue Print Products Co., 1714-20 North Damen Ave., Chicago 47, Ill.* Reproduction machine is called the Direc-Liner printing and developing machine. It develops prints by the ammonia-vapor method.



NOZZLE—*Walter Kidde & Co., 40 East 34th St., New York 16, N. Y.* Type L multi-jet nozzle is designed for smothering dip-tank and drainboard flammable-liquid fires with carbon-dioxide gas. Gas is emitted in a fan-shaped blanket that hugs the liquid surface.

SAFETY GOGGLE—*American Optical Co., Southbridge, Mass.* Lightweight, safety goggle has an all-plastic frame and a single plastic acetate lens. Listed as AO 67, goggle is available with either green or white lens color, and is replaceable.

OPTICAL SHIELD—*American Optical Company, Southbridge, Mass.* A lightweight, seamless hand shield is recommended for short tack- and setup-welding jobs. The shield has a 5½-in. fiber handle and, without the glass, weighs 11 oz.

GOGGLE—*Univis Lens Co., Dayton 1, Ohio.* Safe-T-Vis safety goggle is made of an allyl casting resin said to incorporate lightness, comfort and the safety features of plastics as well as to resist surface scratchings. Lenses come in four goggle styles in a selection of sizes.

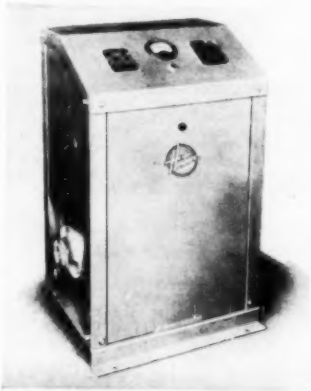
GOGGLE—*Chicago Eye Shield Co., 2300 Warren Blvd., Chicago 12, Ill.* Goggle utilizes a forehead rest and balanced-temple suspension. Called the Cesco Spec-Lite goggle, it weighs 1 oz. The one-piece plastic lens is replaceable. Goggle can be worn over personal glasses and comes with either clear or glare-reducing green plastic lenses.

GOGGLE — *American Optical Co., Southbridge, Mass.* Head-rest safety goggle designed for protection for gas welders, burners, cutters, brazers and furnace men can be thrown into off-guard position by a flick of the wrist.

FIRE EXTINGUISHERS—*American-LaFrance-Foamite Corp., Elmira, N. Y.* Resistance-welded silicon bronze fire extinguishers with a 2½-gal. capacity replace the riveted and copper-fabricated unit of the same capacity. The line includes soda-acid; foam; plain water; and anti-freeze water-type.

ADDING & SUBTRACTING—*H. M. Edmunds Co., 6 East 39th St., New York 16, N.Y.* Addition and subtraction of fractions of an inch is done by a Rapidadd Chart. Chart has no moving parts. Fractions to 64ths can be handled. The two fractions are selected on two edges of chart.

KIT FOR HANDICAPPED PERSONS—*Lapeer Mfg. Co., 2906 W. Grand Blvd., Detroit, Mich.* A kit of holding devices is designed for handicapped persons. A lever locks and releases working tool. Gripping pressure is adjustable. Kit includes three devices, a vise wrench, 7 in. long that can hold any shape, a Knu-Vise pliers, which accommodates varied thicknesses, and a Flexi-Grip pliers that requires no presetting.

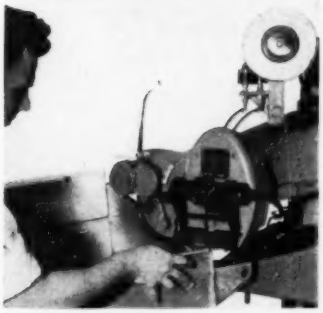


SINGLE-CIRCUIT CHARGER—*Hertner Electric Company, 12690 Elmwood Ave., Cleveland, Ohio.* Automatic single-circuit, motor-generator battery charger, known as the "Charge-O-Matic" replaces the Model H. It is a package unit occupying less than 4 sq. ft. of floor space.

BATTERY CHARGER — *Electric Products Co., 1725 Clarkstone Road, Cleveland 12, Ohio.* Single-circuit battery charger for on-the-spot charging of batteries for lift trucks can be handled by the truck operator.

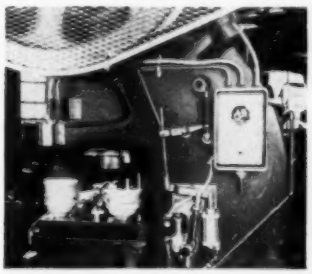
CHARGE INDICATOR—*Gould Storage Battery Corp., Trenton, N. J.* Charge indicator gives momentary charge condition of the battery and keeps the operator informed as to state of charge throughout the shift.

MATS—*Flexi-Mat Corp., 215 W. Illinois St., Chicago 10, Ill.* Sponge-rubber mats with tile-rubber top surfaces for comfortable footing are cut in sizes to fit the requirements of the standee worker from process sheets 36 in. by 30 ft.



METAL STITCHERS—*Stitching Wire Div., Acme Steel Co., 2840 Archer Ave., Chicago 8, Ill.* Model N2A-8, and heavy-duty model, N2C-25, Acme-Morrison metal stitchers, fasten metal to metal, or to non-metallic materials. Machine requires no pre-punching or pre-drilling.

POWDER EXTINGUISHER—*Walter Kidde & Co., 40 E. 34th St., New York 16, N. Y.* Dry chemical powder extinguisher is designed for use against flammable liquid and electrical fires in industrial plants. The extinguisher, made in 20- and 30-lb. capacities, contains a special dry powder mixture that will not pack or obstruct discharge.



PUNCH-PRESS GUARD — *Graham Specialty Co., 12925 Auburn, Detroit 23, Mich.* Air and electrically-operated punch-press guard offers a set of push-buttons, located far enough apart so the operator can only touch one button at a time.

FLEXIBLE TEMPLET — *Flexible Template Co., Camden, N. J.* Flexible templet for layout work is available in lengths of 1-ft. intervals. Templet consists of a spring-steel flexible arm and thumb screw-clamp locating bars.

SCRAPER — *Ampco Metal, Inc., Milwaukee 4, Wis.* Self-sharpening floor scraper is constructed of corrosion-resistant non-sparking aluminum bronze with serrated edges designed so that the scraping edge is flat against the floor or scraping surface. Scraper is 8 in. wide.

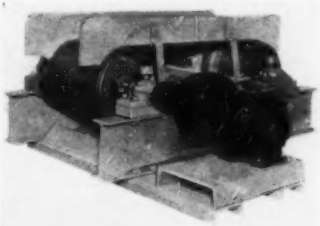
FLOOR MACHINES—*Breuer Electric Mfg. Co., 5100 Ravenswood Ave., Chicago 40, Ill.* Floor machines offer the control handle in proper relation to the revolving brush to counterbalance starting and running torque so that the machines have better control. Machine is offered in five models with brush spreads ranging from 12 to 20 in.

SWEEPER—*G. H. Tennant Co., 2530 N. 2 St., Minneapolis 11, Minn.* High-speed power sweeper, equipped with a 26-in. revolving brush and vacuum dust control is said to enable one man to sweep up to 44,000 sq. ft. of floor per hr. Sweeper with a self-starter, is driven like a car, and is powered by a 6-hp. air-cooled gasoline engine.

SLIDE RULE—*Pickett & Eckel, Inc., 1111 S. Freemont Ave., Alhambra, Calif.* Climate-proof all-metal slide rule, called the Ortho-phase log-log slide rule, is made of plastic-covered magnesium alloy, and is manufactured to 0.001-in. tolerance.

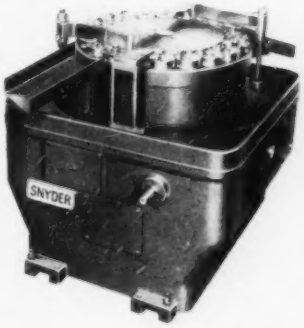
SCRAP CHOPPER—*Durant Tool Supply Co., 155 Orange St., Providence, R.I.* Automatic scrap chopper, which can be moved from press to press will work in any position. Machine takes stock up to a thickness of 1/16 in.

OINTMENT — *Cutter Laboratories, Fourth and Parker Sts., Berkeley 1, Calif.* Dermesthetic ointment for industrial rashes, itching of poison oak, poison ivy and other pruritic conditions combines benzyl alcohol, phenol and benzocaine to obtain triple-action anesthetic control of itching.



SEPARATORS—*Dings Magnetic Separator Co., 4740 W. McGeogh Ave., Milwaukee 14, Wis.* Self-contained horizontal and inclined magnetic-pulley-type separators are designed to provide automatic removal of tramp iron from such materials as coal, plastics, ore, chemicals and rock.

SHEAR STAND—*Beverly Shear Mfg. Co., Chicago, Ill.* Tripod-type welded all-steel shear stand is designed to support the Beverly throatless and Beverly slitting shears, and is adaptable to many types of machines and tools. The top mounting plate measures 7x11 in.



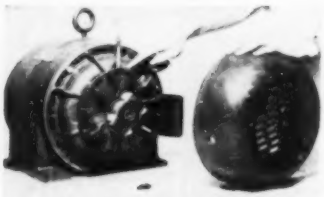
AUTOMATIC MACHINE—*Snyder Tool and Engineering Company, 5400 E. Lafayette, Detroit, Mich.* Special-purpose, automatic-cycle machine for assembling the packing washer onto the groove in hydraulic brake pistons embodies a continuously revolving, variable-speed table. Cycle is timed for completion of 50 assemblies a mi

CONTAINERS—*Contine pany, New York, N* caution, in equa workers refreshed and live through cartoon-printed paper cups. Design, typography, and color can be varied to suit the application.

DISPENSER — *American Dispenser Co., Inc., 215 Fourth Ave., New York 3, N.Y.* Dispenser for powder, beads, or pumice soap, called Powdurn, has no ratchets, gears, or mechanical agitators. Container rocks back and forth shaking powder into hand.

SLIDE RULE—*Plus & Minus Corp., 150 Broadway, New York 7, N.Y.* Slide rule adds, subtracts, and converts simultaneously in one operation. Fractions of an inch, decimals of an inch and millimeters can be handled. Scales A and B are graduated in 64ths. Scales C and D are given in the decimal and millimeter equivalents of each of these fractions.

Parts and Materials



MOTORS—*General Electric, Schenectady 5, N. Y.* The Textolite corrosion-resistant fan is now offered as standard equipment on the GE totally inclosed motors. GE Tri-Clad totally inclosed fan-cooled motors are available in popular sizes from 1 to 20 hp.

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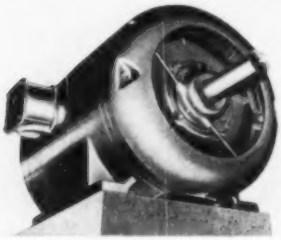

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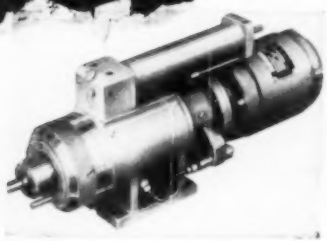

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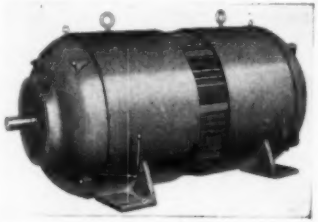

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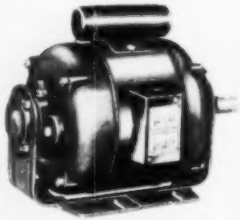

ELECTRIC MOTORS—*Kingston Conley Div., Hoover Co., North Plainfield, N. J.* Rubber-mounted motors for heavy-duty service are manufactured in ratings up to ½ hp. 1725 and 3450 rpm. Motors are made in both single-phase and polyphase types.

GEAR MOTOR—*Reliance Electric and Engineering Co., 1074 Ivanhoe Rd., Cleveland, Ohio.* Lightweight, helical-gear, self-contained, speed-reducing unit is known as the Philadelphia-Reliance GearMotoR. Geared portion is made by the Philadelphia Gear Works, Inc.

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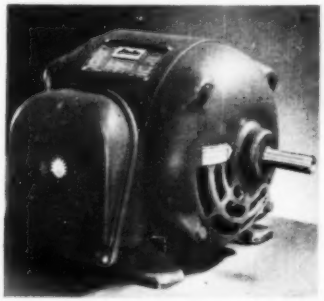

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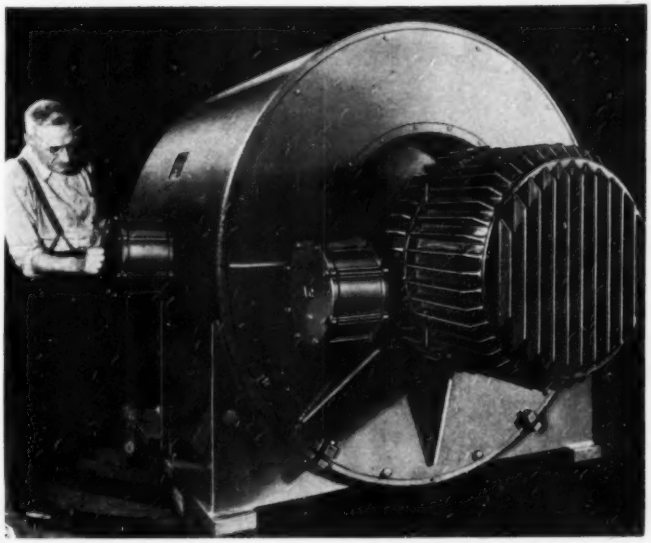

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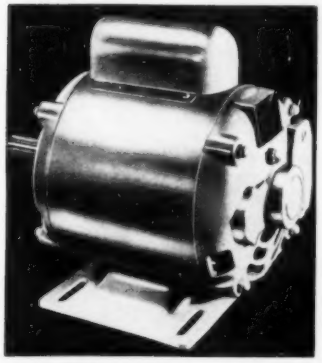
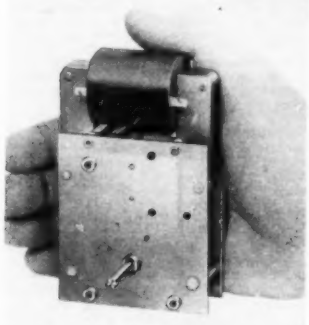


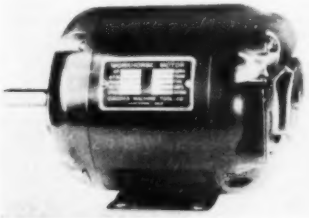
ELECTRIC MOTORS—*A. O. Smith Electrical Mfg. Co., New York 17, N.Y.* Three lines of general-purpose electric motors called Permamotors include fractional-hp. ratings, integral-hp. single-phase ratings, and integral-hp. polyphase ratings.

POWER DRIVE—*Sterling Electric Motors, Inc., 5401 Anaheim-Telegraph Rd., Los Angeles 22, Calif.* Variable-speed electric power drive, the Speed-Trol, provides fingertip speed control throughout entire speed range, combines motor and speed control in one unit, and fits standardized NEMA motor mountings.

MOTOR GEARS—*Fairbanks-Morse & Co., Chicago 5, Ill.* Line of motor gears with an axial airgap motor is available in ratings from ¾ to 10 hp. Units are symmetrical in design.



MOTOR—*T. C. Smith Mfg. Co., Springfield, Ill.* Fractional-hp. motor with high-torque capacity at rated voltage has a stalling torque of 75-in.-oz. Unit is the shaded-pole, induction type, and will fit in the hand.

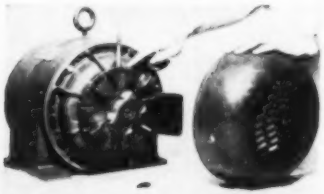


ELECTRIC MOTOR — *Crozier Machine Tool Co., Hawthorne, Calif.* Heavy-duty motor is single-phase, ½-hp. type. Due to its low slippage, 2 pole develops 3520 rpm., while 4 pole develops 1760 rpm. Called the Workhorse, it weighs 29 lb.

MOTORS—*Foster Mfg. Co., One Kinsey Ave., Buffalo, N.Y.* Line of motors, available in split-phase or capacitor-start types, are manufactured in 1/6-, ¼-, 1/3- and ½-hp. capacities, with or without thermal-overload protectors.

Parts and Materials

AMERICAN MACHINIST 36th ANNUAL REVIEW



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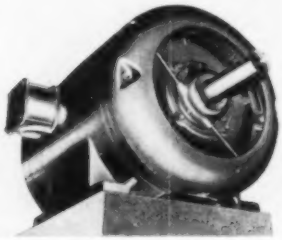

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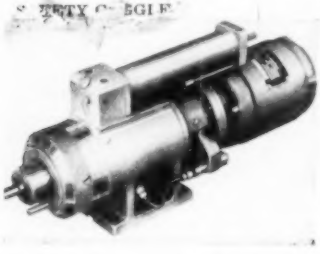

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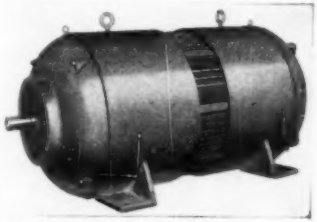

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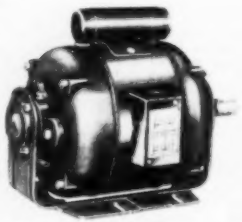

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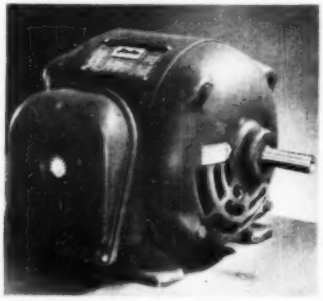

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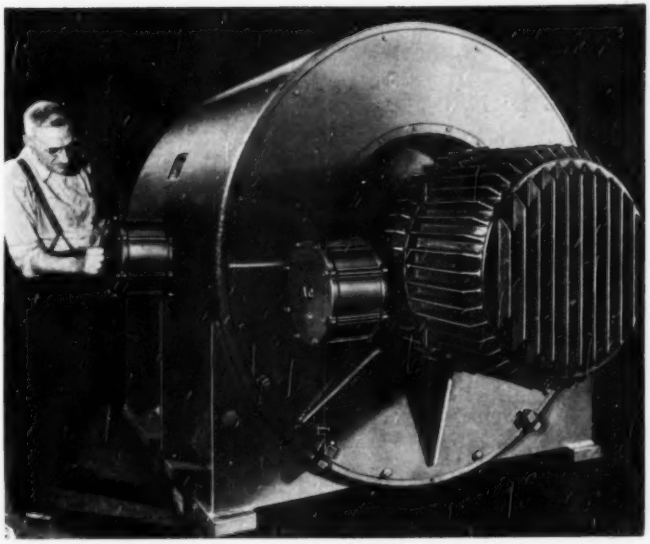

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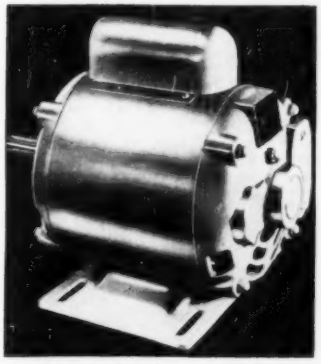
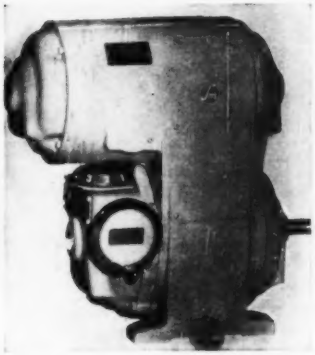
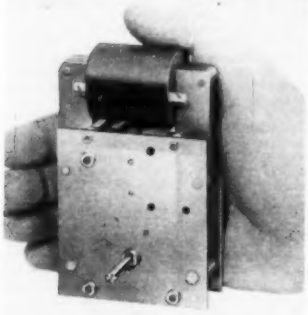


ELECTRIC MOTORS—*A. O. Smith Electrical Mfg. Co., New York 17, N.Y.* Three lines of general-purpose electric motors called Permamotors include fractional-hp. ratings, integral-hp. single-phase ratings, and integral-hp. polyphase ratings.

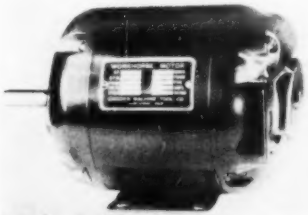


POWER DRIVE—*Sterling Electric Motors, Inc., 5401 Anaheim-Telegraph Rd., Los Angeles 22, Calif.* Variable-speed electric power drive, the Speed-Trol, provides fingertip speed control throughout entire speed range, combines motor and speed control in one unit, and fits standardized NEMA motor mountings.

MOTOR GEARS—*Fairbanks-Morse & Co., Chicago 5, Ill.* Line of motor gears with an axial airgap motor is available in ratings from ¾ to 10 hp. Units are symmetrical in design.

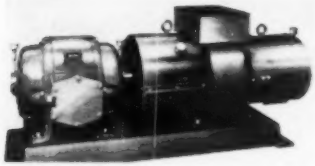


MOTOR—*T. C. Smith Mfg. Co., Springfield, Ill.* Fractional-hp. motor with high-torque capacity at rated voltage has a stalling torque of 75-in.-oz. Unit is the shaded-pole, induction type, and will fit in the hand.



ELECTRIC MOTOR — *Crozier Machine Tool Co., Hawthorne, Calif.* Heavy-duty motor is single-phase, ½-hp. type. Due to its low slippage, 2 pole develops 3520 rpm., while 4 pole develops 1760 rpm. Called the Workhorse, it weighs 29 lb.

MOTORS—*Foster Mfg. Co., One Kinsey Ave., Buffalo, N.Y.* Line of motors, available in split-phase or capacitor-start types, are manufactured in 1/6-, ¼-, 1/3- and ½-hp. capacities, with or without thermal-overload protectors.



MOTOR-GENERATORS — *Bogue Electric Mfg. Co., 40 Iowa Ave., Paterson 3, N. J.* Line or high-frequency motor-generators with output frequencies of 300-400 cycles and size range from 1 to 250 kw., permit operation of machine tools at high speeds without necessity of costly high-speed gear ratios.

SPEED CHANGERS—*Metron Instrument Co., 432 Lincoln St., Denver 9, Colo.* Low-power speed-changing applications requiring high ratios are possible with the multiple-section miniature speed changers. Units are offered in standard one, two, and three sections with ratios to 3375 to 1.

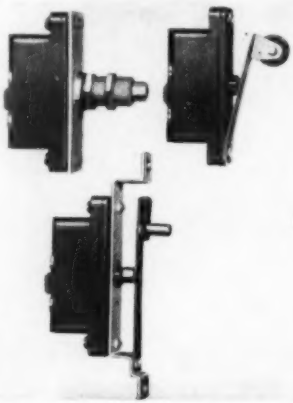
GENERATOR—*The High-Frequency Heating Co., 143 Glen Park Ave., Gary, Ind.* Generator for induction heating on a production basis, known as the HFH-1.2A-L electronic-power generator, heats any metal, magnetic or not, by induction.

GENERATOR — *Westinghouse Electric Corp., Industrial Electronics Div., Plant No. 4, Baltimore 3, Md.* 50-kw., 450-kc. radio frequency generator and a matching two-position worktable has a built-in sink for use with high-production induction-heating jobs.

GENERATORS—*Westinghouse Electric Corp., Industrial Electronics Div., Plant No. 4, Baltimore, Md.* Three 20-kw. 450-kc. radio-frequency generators have generator, worktable or sink, current transformers and water fittings consolidated into one unit. Generators are suited to brazing and soldering; type B, for hardening applications; and type C for soldering, brazing, and hardening applications.

SNAP SWITCH—*Allen-Bradley Co., Milwaukee, Wis.* The No. 600 manually operated snap switch for starting motors of 1 hp. or less, has an overload device which operates on the soldered-ratchet principle. Switch cannot be held closed under sustained overload, but can be reset with the regular switch lever, after overload is cleared.

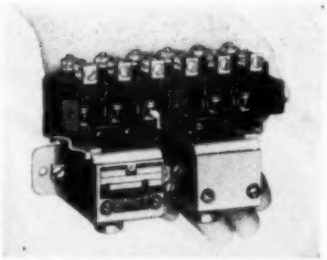
MOTOR-GENERATOR—*Motor Generator Corp., Troy, Ohio.* Sets operate magnetic chucks of vertical-spindle and rotary surface grinders, and are available in generator capacities ranging from 500 watts through 25,000 watts, dc.



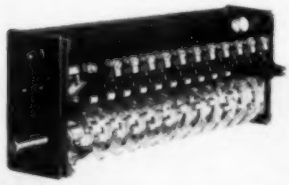
SERIES OF OPERATORS—*Industrial Controller Div., Square D Co., 4041 N. Richards St., Milwaukee 12, Wis.* Series of operators is offered for their precision snap switch, a self-contained contact mechanism for making or breaking a circuit. The series of three operators can be added to the basic mechanism to extend the unit's applications.

TIME SWITCH — *Sangamo Electric Co., Springfield, Ill.* Switches are now equipped with fully inclosed hysteresis-synchronous, low-speed motors. Design is said to give higher torque both in starting and synchronous operation. Closer time limits between settings permit a wider range of applications.

TIME SWITCH—*Sangamo Electric Co., Springfield, Ill.* Time switch with over-all dimensions of 3x5¾x3 in., Type S, is powered by a high-torque, synchronous, self-starting, low-speed motor.



REVERSING CONTACTOR—*Industrial Controller Div., the Square D Co., 4041 N. Richards St., Milwaukee 12, Wis.* Compact ac. and dc. reversing contactor is designed to control small motors used in connection with small hoists, mechanical speed changers and other intermittent-duty applications.



LIMIT SWITCH—*Allen Bradley Co., Milwaukee, Wis.* Heavy-duty rotating-cam limit switch will open and close up to 12 circuits at any position of the actuating camshaft. Contactors are individually detachable.

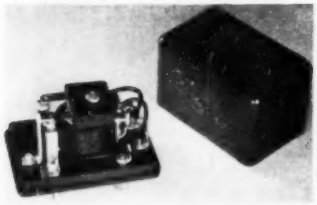
SWITCH—*Naken Engineering & Mfg. Co., 25 N. Franklin St., Chicago 6, Ill.* Heavy-duty foot-switch is constructed to prevent dirt and chips from entering. Two models are available, Model FS-40, illustrated, with cord, plug, and electric outlet, and FS-50, with a cable clamp which replaces the cord and outlet.

STARTING SWITCHES — *General Electric's Control Division, Schenectady 5, N. Y.* Line of manual starting switches for use with fractional-hp. motors, are available in five types: with general-purpose inclosure; without inclosure; combination unit and selector switch; cast iron inclosure for wet locations; and a similar type for hazardous locations.

SOLENOID CONTACTORS — *Ward Leonard Electric Co., Mount Vernon, N.Y.* Solenoid contactors, primarily for use in ac.-motor controllers listed as sizes 2 and 3, are also applicable for resistive heating, and similar controls for remote and automatic load-switching purposes. Sizes 2 and 3 units have maximum ratings of 25 and 50 hp., respectively.

SWITCH—*Diaphlex Div., Cook Electric Co., Chicago 14, Ill.* High-pressure switch, the Hydtrol, features linear adjustment over an operating range from 50 to 5000 psi. The on-off differential is adjustable and ranges from 5 to 50%. It is applicable to the control of high-pressure hydraulic systems containing flammable liquids and features 9½ cu. in. of displacement.

SWITCH—*Durakool Inc., Elkhart, Ind.* Mercury-switch models range from 1- to 65-amp. capacity. An electric weld seals hydrogen gas under pressure in the metal case. The hydrogen gas is claimed to kill the usual arc between the mercury and the contact points of the switch.



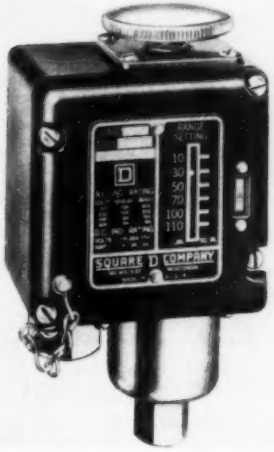
RELAY—*Grayhill, 1 N. Pulaski Rd., Chicago 24, Ill.* Relay with plug-type connectors, which are inserted into receptacles on the machine, are available in various contact arrangements, and range from 6 to 230 v. ac. or dc. The silver contacts are rated at 10 amp. per pole on a resistive load.

RELAY—*Ward Leonard Electric Co., Mount Vernon, N. Y.* Motor-driven time-delay relay with composite connections, Model 362, is designed for use in control equipment or system where an adjustable time delay, after closing the pilot circuit is required. Timing is adjustable over a range to 63 min. max.

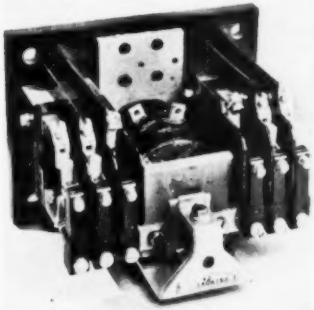
RELAY—*Manning, Maxwell & Moore, Inc., Bridgeport, Conn.* Micro-sensitive relay, Model 143X, utilizes the Micro-sen Balance Principle. Designed for use as a component of other electronic or electro-mechanical apparatus, unit provides a full output change of 5 milliamperes for a 2 micro-amp. input change.

RELAY—*Weltronic Co., 19420 W. Eight Mile Rd., Detroit 19, Mich.* Model 312KS2 is a 3-phase, multiple-control relay-timer in a single-panel unit. Complete remote control over 3, 6, or 9 transformer groups is possible with auxiliary timers. The unit includes controls for 1, 2, 3; cascade; or simultaneous welding.

FOOT SWITCH—*Black & Webster, Inc., 126 Massachusetts Ave., Boston, Mass.* Model SA foot switch has its pivot located under the arch of the foot so that it operates with a rocking instead of a pushing motion. Unit measures 9x3½x2½ in.



PRESSURE SWITCH—*Square D Co., Industrial Controller Div., 4041 N. Richards St., Milwaukee 12, Wis.* Pressure switch is for application in the control of pneumatic or hydraulic machines. Quick-make and quick-break action is assured by use of a single-pole, double-throw snap-switch mechanism.

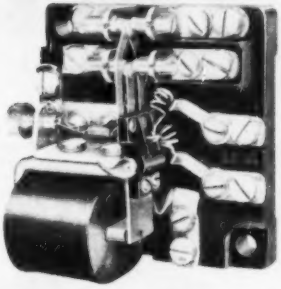


RELAY—*Westinghouse Electric Corp., Pittsburgh 30, Pa.* Heavy-duty rear-connected multi-pole dc. magnet-operated relay, listed as model AYB, is available in 4-, 6-, 8-, 10-, 12, or 14-pole combinations. Relay is designed for operation on 600 v. or below.

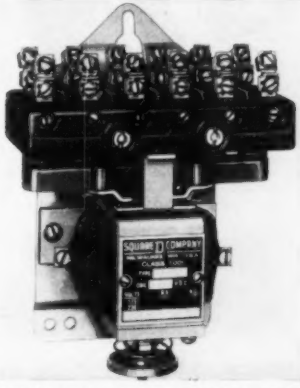
LOAD CONTROL—*The G. C. Wilson & Co., Chatham, N. J.* Flex-I-Trol electronic load control is for use with motor-operated processes such as pulverizers, pumps and extruders. Constant motor load is maintained by regulating the input feed.

RELAY—*Allied Control Co., Inc., 2 East End Ave., New York 21, N.Y.* Small, light, medium-power, single-pole type AS relay is 1⅝ in. long, 1 13/16 in. high and 15/16 in. wide, and weighs 50 grams. Ac. and dc. relays are available, rated at 1 watt.

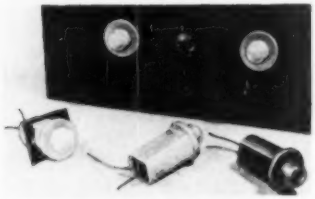
SOLENOID VALVE—*Hanna Engineering Corp., Chicago, Ill.* Four-way solenoid valve of the balanced-spool type is controlled by a built-in solenoid pilot valve. Lines may be connected to bottom, sides or a combination of both as desired.



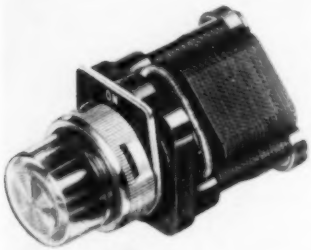
RELAY—*Allied Control Co., Inc., Dept. S, 2 East End Ave., New York 23, N. Y.* Type BK relay is for use under conditions of limited-power supply and also where precise operating characteristics are vital. Relay is supplied in one pole or two pole, normally open or normally closed contact arrangements.



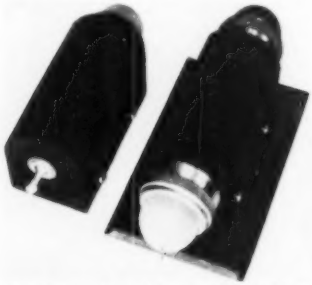
RELAYS—*Square D Co., 4041 N. Richards St., Milwaukee 12, Wis.* Two dc. magnetic multi-pole relays have straight-line vertical-solenoid action said to minimize the effects of shock and vibration. Listed as Types Q and R, relays take dc. voltages up to 250 v.



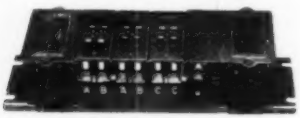
LIGHT SUB-ASSEMBLY—*The American Electronics Corp., 226 N. Fourth St., Columbus 15, Ohio.* Indicator-light sub-assembly is a neon unit which has a translucent plastic housing. It incorporates the resistance and a standard NE-2 glow lamp, which transmits a diffused light through the translucent plastic.



PILOT LIGHT—*Industrial Controller Div., Square D Co., 4041 N. Richards St., Milwaukee 12, Wis.* Oil-tight pilot light designed for machine-tool applications where cutting oils and coolants are used is designed for panel mounting through a hole 1 7/32 in. in dia. Caps come in a variety of colors.

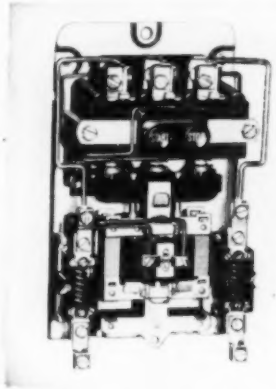


INDICATING LAMP—*The H. E. Kirkland Co., Morristown, N. J.* Surface-type indicating lamp, Type Q1, consists of a die-cast base with a metal shell or cover which is held to the base by two screws on each side.



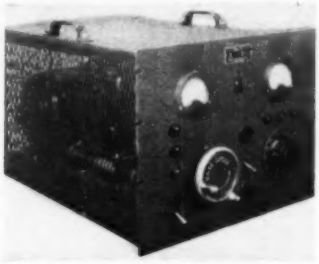
PANELBOARD—*Square D Co., 6060 Rivard St., Detroit 11, Mich.* Circuit breaker plug-in panelboard incorporates a system of branch-circuit terminal marking. The 3-phase 4-wire arrangement of the NMO panelboard eliminates doubt as to phase identification of branch circuits.

CONTROL—*Switch-O-Matic Co., 124 W. Hadley St., Whittier, Calif.* Control for drillpresses, engine lathes, and turret lathes with motors of 220, 440 and 550 v., can be used whenever accurate automatic spindle-reversing operations are required. Tap sizes are limited only to chucking capacity of machine.



MAGNETIC STARTER—*Ward Leonard Electric Co., Mount Vernon, N. Y.* Bulletin 4112. Size 2 ac. solenoid-operated starters are intended for applications where across-the-line, non-reversing starting of polyphase squirrel-cage induction motors and single-phase motors are permissible.

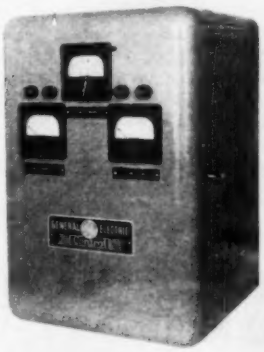
LOW-VOLTAGE CONTROLLERS—*General Electric Co., Schenectady 5, N. Y.* Low-voltage controllers with draw-out air circuit breakers are for use with ac. motors up to 800 hp. Controllers are designed for controlling squirrel-cage, wound-rotor, synchronous, or multi-speed ac. motors or dc. motors.



FREQUENCY CONVERTER—*Polar Engineering Co., 313 Main Street (Rear), Danbury, Conn.* Custom-built frequency converters are offered. The power supply illustrated was designed to give a source of three-phase power to operate small synchronous motors of special design.

AIR CIRCUIT BREAKER — *Switchgear Div., General Electric Co., Schenectady 5, N.Y.* Air circuit breaker for low-voltage circuits (600 v. and below) is known as Type AK-1. Unit comes in two ratings, AK-1-15, rated at 15 to 225 amp. with a 15,000-amp. interrupting rating, and AK-1-25, rated at 35 to 600 amp. with a 25,000-amp. interrupting rating.

MOTOR-CONTROL CENTER—*Control Div., General Electric Co., Schenectady 5, N. Y.* Motor-control center for controlling any number of motors is rated up to 200 hp. at 440 v. from one central location. Sections are 90 in. high, 20 in. wide, and 12 in. deep. Starters are furnished in five sizes.

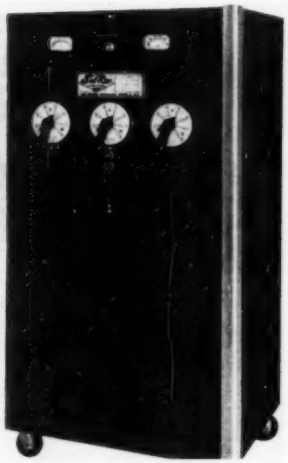


AMPLIDYNE CONTROL — *Controls Div., General Electric Co., Schenectady 5, N.Y.* Amplidyne control unit, is used on steel mill and similar mill and processing line-control applications where speed, current, or voltage regulations are required. Unit provides motor speed-limit control. Unit is 18x12x11 in.

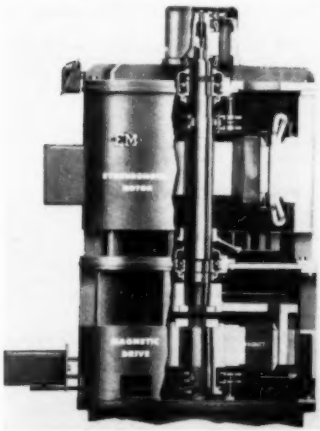
RECTIFIER—*Bart-Messing Corp., 45 Morgan Ave., Brooklyn 6, N. Y.* Sel-Rex selenium rectifier, style 750-12, is designed specifically for barrel plating. It is equipped with a tap switch for voltage control from 9 to 12 v., and is capable of operating one or more barrels depending on size and load.

RECTIFIER—*Bart-Messing Corp., 45 Morgan Ave., Brooklyn, N.Y.* Selenium rectifier is designed to allow a reserve of voltage when plating with diluted solutions of chromic acid or other baths. Rectifier is a 9-v., 2500-amp. unit.

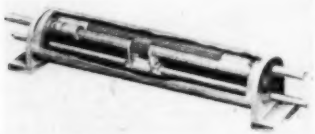
RECTIFIER—*Mellaphone Electronic Rectifier Co., Rochester 2, N.Y.* Line of low-voltage high-current rectifiers is for operation from 220- or 440-v., three-phase ac. power lines. Output voltage in dc. can be varied from 0 to 6 v. with a capacity of 600 amp. or from 0 to 12 v. with a capacity of 300 amp.



POWER SOURCE — *Bart-Messing Corp., 45 Morgan Ave., Brooklyn 6, N. Y.* Dc.-power source for requirements up to 5000 amp. with varying voltages from 1 to 9 v., is particularly suited for chromium, bright-nickel and acid-copper plating as well as electro-cleaning and electro-polishing.



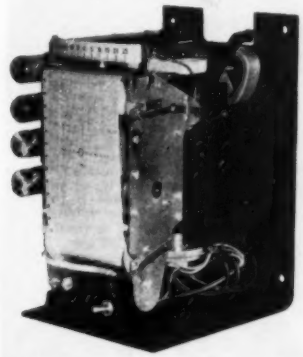
MAGNETIC-DRIVE UNIT—*Electric Machinery Mfg. Co., Minneapolis 13, Minn.* Vertical synchronous-motor magnetic-drive unit has adjustable-speed control for centrifugal pumps. Illustrated is a 250-hp. 1200-rpm. drive unit.



SYNCHRONIZER—*Table Associates, 60 East 42nd St., New York, N.Y.* Unit is completely enclosed and is designed to provide absolute synchronization between two sources of power. By addition of extra pinions, any number to six sources can be synchronized.

HOUSING—*The Aerovox Corporation, New Bedford, Mass.* Line of motor-capacitor hardware includes a housing with a single mounting bracket, the mounting bracket that fits around the usual round capacitor, the top- and bottom-end caps, and the motor-capacitor housing with mounting lugs.

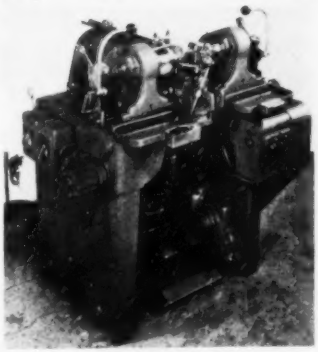
MOTOR-CAPACITOR — *Transformer and Allied Products Div. of the General Electric Co., Schenectady 5, N. Y.* Pyranol motor capacitor is available in all popular ratings and is inclosed in 10-gage steel tubing. Bushings are of silicone which is impervious to oils, acids, and alkalies.



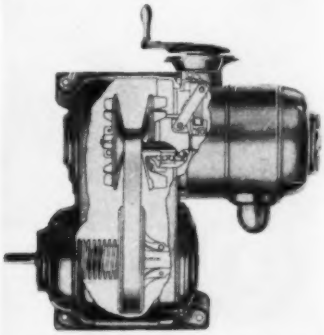
WATTMETER—*Meter and Instrument Div., General Electric Co., Schenectady 5, N. Y.* Photoelectric recording wattmeter is designed for analyzing welding circuits and measuring industrial heating load, motor-starting load and power surge. It can measure dc. or ac. power up to 10,000 cycles per sec.

MAGNETIZING — *Ace Typewriter Service, 909 Maple Ave., Evanston, Ill.* Magnetizing and demagnetizing of small tools is done by the Duo-Mag. Unit is rated for intermittent use only on 110-120 v., ac. or dc. for magnetizing and 110-120 v., 60-cycle ac. for demagnetizing. Tool is inserted in unit for both operations.

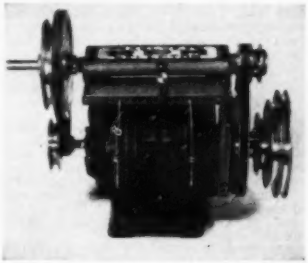
MAGNETIC STARTER—*Ward Leonard Electric Co., Mount Vernon, N. Y.* Non-reversing magnetic starters are designed under NEMA and Underwriters' Laboratories, Inc., standards. The compact starters have a max. inclosed rating of 7½ hp., 440-550 volts, 3-phase, 60 cycles.



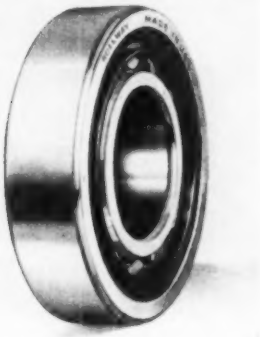
ARMATURE WINDER — *The Globe Tool & Engineering Co., 436 Davis Ave., Dayton 3, Ohio.* Automatic armature winder features core after being placed into loading bracket, untouched by operator until removed as a completely wound armature. Machine is automatically controlled from its cam-cycle control.



MICROSPEED CONTROL — *U. S. Electrical Motors, Inc., 200 E. Slauson Ave., Los Angeles 54, Calif.* Varidrive motor enables a machine operator to obtain infinite speeds. The microspeed control allows any speed from 1 to 10,000 rpm., while the motor is operating.



RPM. SELECTOR—*Sunset Equipment Co., 1813 West 11th St., Los Angeles 6, Calif.* McKelvey's rpm. selector attaches to and becomes part of an electric motor and permits complete selection of speeds leaving motor. Speeds range from 66 to 10,000 rpm.



BEARINGS—*The Rollway Bearing Co., Inc., Syracuse, N. Y.* Precision cylindrical roller bearing with a steel retainer is called Tru-Rol. Bearing features a one-piece steel retainer with pockets having double flanges or guide lips to keep rollers in alignment. Bearings are offered in a range of sizes conforming with S.A.E. standards.

BALL BEARING — *New Hampshire Ball Bearings, Inc., Peterborough, N. H.* Small ground angular-contact (radial-thrust) micro ball bearing is of a non-separable design, with a machined, solid-bronze retainer carried by the ground lands of the inner ring. Dimensions are 5/64-in. bore by ¼-in. O.D. by 3/32-in. wide, to ABEC tolerances 1 and 5.

BEARINGS — *Pal-Vin Machine and Mfg. Co., Cleveland, Ohio.* Radial and angle-type bearings are designed to distribute substantially the load throughout the circumference of the bearing. Increased-load sustaining capacity is afforded by multiplying the rows of rotating bearing elements.

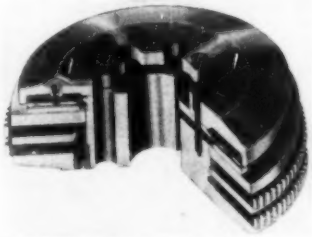
BALL BEARINGS—*The Federal Bearings Co., Inc., Poughkeepsie, N. Y.* XLS bearing series is produced in sizes from 1⅝- to 10-in. bores with from 2 9/16- to 13¼-in. O.D. Bearings offer a cross-section area through any pair of races said to be about 68% of the area of a corresponding light series metric size bearing.

BEARINGS—*Barden Corp., Danbury, Conn.* Precision ball bearings for instruments, machine tools and special precision application, are manufactured with tolerances not less than BEC-5, many to BEC-7 or better. Groove finishes are held to around 1 microinch. Balls are finished to size and sphericity to 0.000010 in.

FRICTION CLUTCHES—*Morse Chain Co., 7601 Central Ave., Detroit 8, Mich.* Line of friction clutches embodying the Morse-Rockford over-center design are toggle-type, small-diameter clutches available in capacities ranging from 0.5 hp. to 1.7 hp. per 1000 rpm.

CLUTCH—*The Carlyle Johnson Machine Co., Manchester, Conn.* Maxitorq floating-disk clutch is now equipped with non-locking type levers designed so that the clutch cannot be locked into engagement.

CENTRIFUGAL CLUTCH—*Saginaw Products Corp., Saginaw, Mich.* Centrifugal clutch features automatic operation, inter-directional drive, and foolproof construction. Utilizing an expanding, self-energizing shoe, the clutch is suitable for use with electric motors or internal combustion engines.



DISK CLUTCH—*Wichita Falls Foundry and Machine Co., Wichita Falls, Texas.* Friction clutch for heavy-duty application is called the Wichita air-tube disk clutch. Clutch is available in 18-, 24-, and 30-in. single- and double-plate sizes, having horsepower capacities from 40 to 1000 hp.

CENTRIFUGAL CLUTCH—*Saginaw Products Corp., 8 B River St., Saginaw, Mich.* Centrifugal clutch with an expanding, self-energizing shoe is suitable for use with electric motors or internal combustion engines, and is especially recommended for small powered units from fractional to 3½ hp.

DRIVE, CLUTCH UNIT — *V-Belt Clutch Co., 3757 Wilshire Blvd., Los Angeles 5, Calif.* Model 2DC drive and clutch unit is designed for twin V-belts. Model rates at 5 to 10 hp.; pulley diameter is 3¾ in.; length is 4⅛ in.

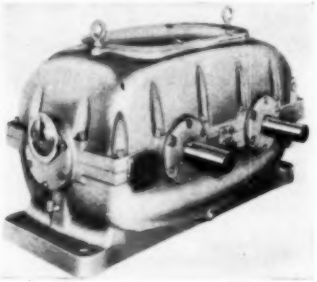
X-WASHERS—*Standard Locknut & Lockwasher, Inc., 511 North Capitol Ave., Indianapolis, Ind.* X-washers for pin sizes from 7/32 to 17/32 in. offer the advantages of a single-unit assembly which can be clamped around the pin.

CLUTCH—*The Edgemont Machine Co., 2128 Home Ave., Dayton 1, Ohio.* Clutch with integral V-belt pulley is self-contained and applicable to small portable conveyors, and special machinery using V-belt or chain drives. It is furnished in ratings of ¾ and ½ hp. at 100 rpm., and in shaft sizes from ¾ to 1¼ in.

TRUCK WHEELS—*The Globe Co., 4000 S. Princeton Ave., Chicago 5, Ill.* Truck wheels embody a cartridge-type bearing. The radial angular roller bearing combines two important bearing functions at once—radial loading and thrust loading. It is called the Duo-Thrust wheel.

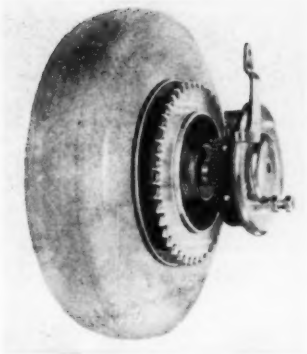
CASTERS—*Industrial Tire and Wheel Co., 109 East Calhoun, Memphis, Tenn.* Steel casters have rubber-tired wheels in rigid and swivel models. Called the Tuf-Tread casters, they are equipped with a double ball race, pressure grease fittings, roller split-sleeve bearings, and are available for light-, medium-, and heavy-duty requirements.

INDUSTRIAL WHEEL—*Aerol Co., Los Angeles 5, Calif.* Water-tight industrial wheel called the Aerol-Seal is furnished with Timken tapered-roller bearings and is made of a lightweight, corrosion-resistant, high-strength aluminum alloy. All parts are manufactured to tolerances with a maximum variation of ± 0.003 in.



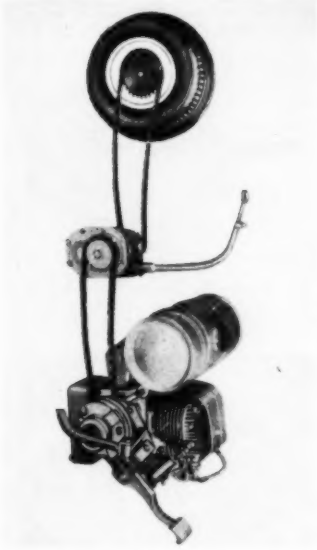
GEAR CHANGER—*Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.* Gear variable-speed changer, the H-6 unit, is rated 20 hp. for speed-variation ratios of 5 to 1 and 6 to 1, and 25 hp. for speed-change ratios of 2 to 1, 3 to 1 and 4 to 1.

BEARING — *Timken Roller Bearing Co., Canton 6, Ohio.* A 25% increase in the radial and thrust load-carrying capacities of their line of tapered roller bearings is announced.



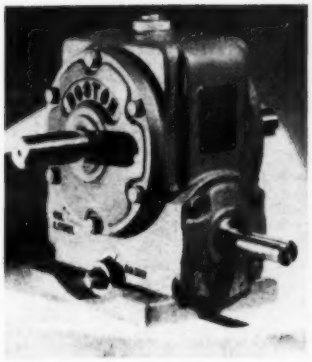
BRAKE—*Saginaw Products Corp., 8 C River St., Saginaw, Mich.* Brake for small motor-driven vehicles has double-action cam operation. A single capscrew and locknut control the internal expanding floating wedge.

MAGNETIC DISK BRAKE—*Stearns Magnetic Mfg. Co., Milwaukee 4, Wis.* Magnetic disk brake series X-60, for fractional-hp. application is offered for 1/6-, ¼-, 1/3-, ½- and ¾-hp. motors. The housing can be removed without disturbing the operating parts.

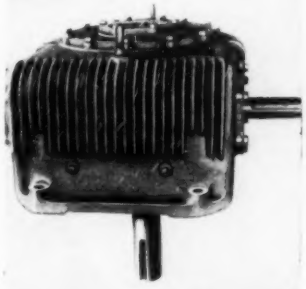


POWER UNIT — *Cushman Motor Works, Lincoln, Neb.* A 14.8-cu. in. heavy-duty, four-cycle, single-cylinder, air-cooled engine develops 4 hp. at 3200 rpm. with manually operated positive-action disk-type clutch and a sliding gear transmission.

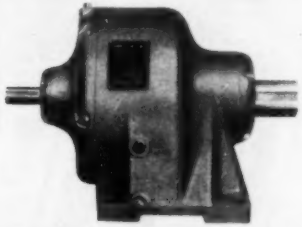
CONTROL—*Speed Selector Inc., 118 Noble Court, Cleveland 13, Ohio.* A 5-hp. speed control utilizes a principle of planetary motion applied to speed changers, making possible infinite ratio, and split-second control of speeds from 0 to 850 rpm., and into reverse where needed.



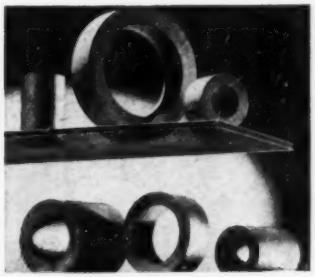
SPEED REDUCER—*Boston Gear Works, Quincy 71, Mass.* Speed reducer to replace the Boston Gear Works Type TA Reductor, known as Type TAN, features heavier gearing which allows increased hp. rating. The worm is made integral with its shaft.



SPEED REDUCERS — *Cone-Drive Div., Michigan Tool Co., Detroit 12, Mich.* Standard series of 7-in. center-distance heavy-duty speed reducers, Series 7700, is offered in ten standard ratios ranging from 5:1 to 70:1, and is available in three types: HU-7700, with pinion under the gear; HO-7700, with pinion over the gear; and HV-7700, with gear shaft vertical.



SPEED REDUCER — *Winfield H. Smith Corporation, Springville, Erie County, N. Y.* Differential speed reducer features increased overhung load capacities. Called the Winsmith helical-gear differential speed reducer, it provides ratios from 5 to 1 to as high as 50,000 to 1. Horsepower ranges from 0.62 to 81.5.



BUSHINGS—*Carboloy Co., Inc., Detroit, Mich.* Line of standard all-purpose carbide bushings in various sizes are in use as wire guides, bushings and collets. Bushings are available in two groups; short sizes from ⅛-in. to 1⅜-in. O.D. and ⅛-in. to ½-in. long; and 11/16-in. to 3-in. O.D. and ⅞-in. to 1-in. long.

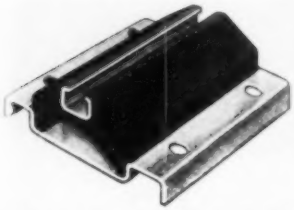
BUSHINGS—*W. F. Meyers Co., Bedford, Ind.* Standard Meyco carbide-inserted drill-jig bushings have tungsten-carbide insert at the two points of wear.

BUSHINGS—*Kennametal, Inc., Latrobe, Pa.* For wear-resistant applications, bushings are offered in Kennametal Grade K6, in 12 O.D. sizes ranging from ⅜ to 1 in.

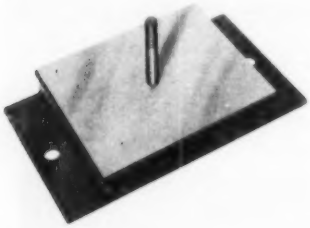
FOOT SWITCH—*The Industrial Controller Div., Square D Co., 4041 N. Richards St., Milwaukee 12, Wis.* Heavy-duty oil tight foot switch inclosed in a cast case and gasketed for oil-tight applications has wide pedal operable from three directions.

FOOT CONTROL—*Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.* Automotive-type foot control for the Clark electric Carloader fork trucks is placed for left-foot operation and has four control positions for different speeds.

GEAR TRANSMISSIONS; SPINDLES—*DoAll Co., Des Plaines, Ill.* Line of gear transmissions and flange spindles are for the Speedmaster variable-speed control unit. Capacities range from 0.1 to 7 hp., having reduction ratios of 40 to 1, 17 to 1, and 4 to 1.



VIBRATION CONTROL—*Lord Mfg. Co., Erie, Pa.* Chan-L-Mount vibration control is 1½ in. high. The bolt head is inserted in either end of the metal channel which holds it while the nut is tightened.



VIBRATION MOUNTS—*Finn & Co., 2850 Eighth Avenue, New York 39, N. Y.* Line of vibration mounts for isolating machinery vibration called Finnflex Vibration Dampner includes two types. CM-H mounts for horizontal and rotary vibration are for use under machinery. CM-V mounts for vertical vibration are for top-heavy and recoil-type machines.

MOUNTING—*Lord Mfg. Co., Erie, Pa.* Shockmount is designed to control shock, isolate high-frequency vibration, and reduce noise transmittance to the floor. It is a heavy-duty mounting with a load capacity up to 7500 lb. per mount.

SPINDLE—*Gidding & Lewis Machine Tool Co., Fond du Lac, Wis.* Quick-change spindle has a double-acting screw lock which eliminates need for draw and drift keys. Also incorporated is a fast taper socket.

TEST PLUGS, FILLING CONNECTORS—*Mechanical Products Corp., 168 N. Ogden Ave., Chicago 7, Ill., Dept. AM.* Hydro-Matic, self-sealing test plugs and filling connectors equipped with expanding stems, are designed to seal plain or threaded holes in flanged or fitted openings of almost any depth in tanks, and other fabricated or cast vessels which require hydrostatic or air-pressure testing.

COUPLING—*American Flexible Coupling Co., Erie, Pa.* American flexible coupling is designed to permit shafts to operate misaligned without transmitting reactionary stresses. Design is based on the Oldham principle.

FITTINGS—*Stanley G. Flagg & Co., 1421 Chestnut St., Philadelphia 2, Pa.* Flagg-Flow threadless malleable pipe fittings made for brazed pipe joints enables the use of plain-end pipe, eliminating thread cutting.

SHEAVES—*Howry Berg Steel and Iron Works, 2949 N. Speer Blvd., Denver 11, Colo.* Pressed-steel sheaves called Power Master are manufactured in A and B sections, single and double groove from 4 to 15 in. inclusive. Demountable hub permits single-, dual- or step-pulley arrangement.

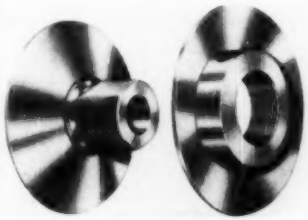
DRILL DRIFTS—*The Cleveland Twist Drill Co., East 49th St., Cleveland 1, Ohio.* Redesigned drill drifts are offered. A shoulder, or flange, has been added on the head end. The enlarged end prevents the drift from flying through the spindle slot.

PILLOW BLOCKS—*Precision Products Co., 815 Pryor St., S.W., Atlanta, Georgia.* Line of porous bronze-bearing pillow blocks are of rigid cast-iron construction Blocks are available in shaft sizes of ½, ⅝, ¾, 15/16, and 1 in.

SYNTHETIC-SAPPHIRE BALLS—*The Linde Air Products Co., Unit of Union Carbide and Carbon Corp., 30 East 42nd St., New York 17, N.Y.* Synthetic sapphire balls polished to a sphericity of less than 10/1,000,000 of an inch are unaffected by acids and have a hardness said to be second only to a diamond.

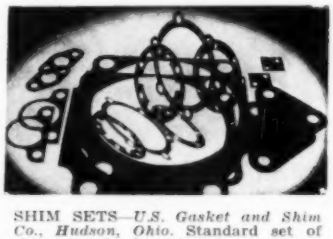
DOWEL PINS—*The Holo-Krome Screw Corp., Hartford, Conn.* Holo-Krome dowel pins have a rust-resistant black-luster finish. Finish is said to act as a lubricant, and retards corrosion and prevents rusting.

GREASE SEALS—*Jervis B. Webb Co., 8951 Alpine Ave., Detroit 4, Mich.* Grease seals on the trolley-wheel bearings of overhead conveyors are said to prevent drip. Bearing is said to retain the lubricant under any operating condition.



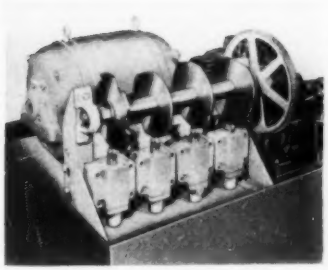
SHEAVES—*Dodge Mfg. Corp., Mishawaka, Ind.* Solid-steel fractional hp. variable-pitch sheave, providing finer adjustment through use of 20 threads is made in a range of pitch diameters. All sizes are available in three standard bores, namely, ½ in., ⅝ in. and ⅞ in.

HANDLES—*Plomb Tool Co., Los Angeles 54, Calif.* Plastic handle screwdrivers feature re-shaped handles with lengthwise ridges to prevent hand slippage. The plastic selected is non-flammable and is a good insulator.

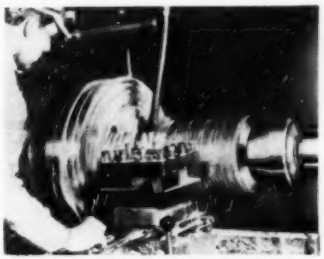


SHIM SETS—*U.S. Gasket and Shim Co., Hudson, Ohio.* Standard set of shims can be furnished in any shape and size with any arrangement of bolt holes. Each set consists of one 0.020-in. shim, three 0.005-in. shims and three 0.007-in. shims. Shim sets can be fabricated in ferrous and non-ferrous materials.

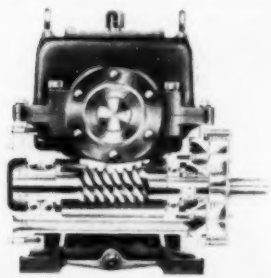
TOOL-MOUNTING FIXTURE—*Avo Equipment Corp., Bryan, Ohio.* Model 7101 tool mounting fixture for portable tools, is adaptable to many screw-driving and nut-setting jobs where it is practical to bring assembly to tool.



MECHANICAL BRAIN—*Hufford Machine Works, Inc., Redondo Beach, Calif.* Hufford Mechanical "Brain" is adaptable to various types of hydraulic equipment. It produces a series of timed repetitive motions to multiple-ram installations utilizing hydraulic cylinders.



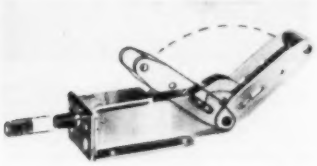
LIVE CENTERS — *Sturdimatic Tool Co., 5220 Third Ave., Detroit 2, Mich.* Live centers adapted to tube turning are offered in 1⅞, 2⅜, 2¾, and 3¼ in. diameters. Standard shanks with Morse tapers are carried in stock while other sizes, taper and blunt-nose type, are built to specifications.



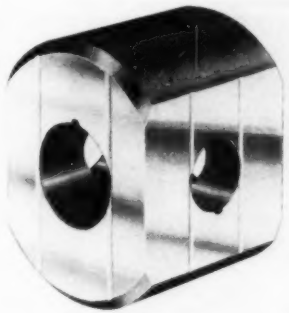
WORM-GEAR DRIVES—*Foote Bros. Gear Machine Corp., Chicago, Ill.* Line of inclosed worm-gear drives in both horizontal and vertical types have carbon-lapped ring seals claimed to prevent oil leakage. Worm-gear drives are available in a wide range of standard ratios, conforming to AGMA and NEMA standards.

STROKE, ROTARY COUNTER ATTACHMENTS—*Durant Mfg. Co., 1945-B, North Buffum St., Milwaukee 1, Wis.* Reset-stroke and rotary counters Model Y are designed especially for incorporation as an integral part of business machines, laboratory equipment and metal-working machines. Stroke counters have a patented ratchet non-slip, pawl-drive mechanism.

POWRARM UNITS—*Wilton Tool Mfg. Co., 936 Wrightwood Ave., Chicago 14, Ill.* Improved models of the Powrarm are offered. One is mechanically operated for light work and the other, hydraulically operated for heavy-duty work. Both position work at desired angle on a 360° horizontal or 180° vertical plane, and hold work under high pressures. Work to 150 lb. can be held at any angle.



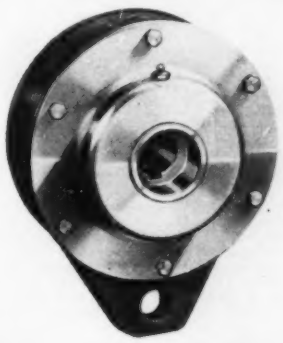
PUSH-PULL CLAMP—*Lapeer Mfg. Co., Lapeer, Michigan.* Push-and-pull clamp, Model P&P-800, is intended to perform in places where space is limited or under circumstances where the operating handle cannot be accommodated except at some distance from the point of pressure application. The clamp exerts up to 800 lb.



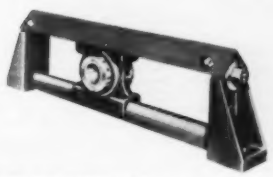
CENTER BLOCK—*Curtis Universal Joint Co., Inc., Springfield, Mass.* Improved center-block design reduces frictional heat to a minimum. The center-block design is utilized in joints from 1¼-in. O.D. to 4-in. O.D.

SPROCKETS—*Morse Chain Co., Detroit 8, Mich.* Series of silent-chain stock drives includes both sprockets and chains. Cast-iron stock sizes of driven sprockets feature finished bores for use with Taperlock bushings. Bushings are available with finished bore diameters in increments of 1/16 in.

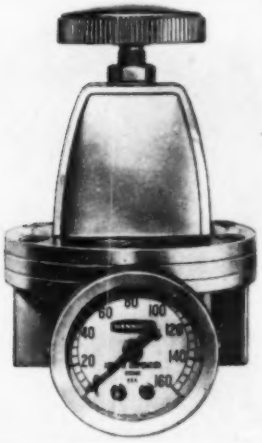
DIE LIFTERS—*The Modern Collet and Machine Co., 401 Salliotte St., Ecorse 18, Mich.* Line of self-aligning die lifters consists of a swiveling eye which accommodates standard lifting hooks and stud assembly for attaching and removing the die lifter. Die lifters are available in four sizes, with maximum lifting capacities of 16, 28, 10, and 100 tons each.



BACKSTOP — *Falk Corp. 3001 W. Canal St., Milwaukee 8, Wis.* Backstop for preventing reverse rotation can be used on conveyor drives, elevator head shafts, and on all applications where reverse rotation should not occur. Gripping action takes place at moment that forward rotation ceases.

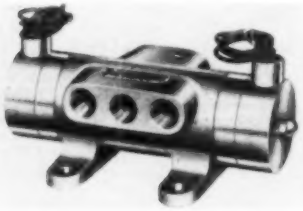


SCREW TAKE-UP—*Dodge Manufacturing Corp., Mishawaka, Ind.* Roller-bearing protected screw take-up, type E, illustrated, is said to be rugged in construction and compact in design. Adjustment of take-up is effected by turning screw heads at either end.



REGULATING VALVE — *Hannifin Corp., 1101 S. Kilbourn Ave., Chicago 24, Ill.* Improved automatic pressure-regulating valve for service on compressed-air supply lines is designed for use on primary air pressures to 150 psi. It can be set to maintain reduced, or secondary pressures ranging from 125 down to 5 psi.

VALVE—*Reeves Pulley Co., Columbus, Ind.* Rotary-type valve is for hydraulic control on their variable-speed transmission. When applied to the transmission the control permits automatic speed regulation for synchronization of different machines, and separate sections of a single machine.



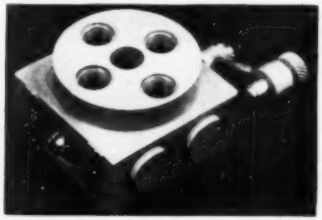
CONTROL VALVE—*Modernair Corp., 4222 Hollis St., Oakland 8, Calif.* Solenoid-operated 4-way control valve, part of the CV control-valve series, measures 7¼ in. over-all for the ⅜-in. port model, and 10¾ in. over-all for the ¾-in port size.

SPEED-CONTROL VALVE—*Galland-Henning Mfg. Co., Milwaukee 7, Wis.* Flo-Trol De Luxe speed-control valve requires no tools for adjustment, as the adjusting sleeve can be turned and set by hand. Unit is mainly brass and therefore has good rust and corrosion resistance.

RELIEF VALVE—*Gerotor May Corporation, P. O. Box 86, Baltimore 3, Md.* Chatter-free relief valve protects hydraulic systems against damaging overloads of pressure. A dash-pot feature stops the chatter. Valve springs are in two sizes of 50-300 and 50-1500 psi.

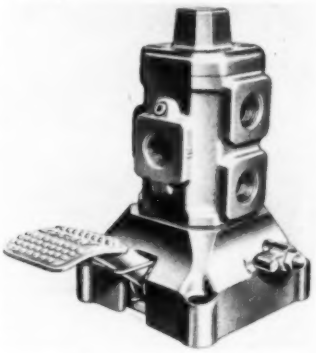
SHAFT SEAL—*Gits Brothers Manufacturing Co., Chicago 23, Ill.* Rotating-shaft seal called Roto-Flex is suitable for such applications as water and oil pumps, fuel oil and gasoline pumps, speed reducers and other uses.

SHUTOFF VALVE—*Greer Hydraulics, Inc., 454 18th St., Brooklyn, N. Y.* High-pressure shutoff valve features induction-brazed joints which are said to be capable of withstanding pressures up to 20,000 psi. without leakage. Valve was designed for use in systems with operating pressures to 5000 psi.

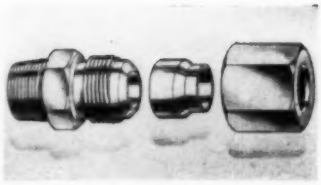


VALVE — *Electrol, Inc., Kingston, N. Y.* 4-way selector valve is designed to control flow to the remote actuating cylinders of hydraulic systems. Valve has four line connections and includes a group of spring-loaded balanced-type poppet valves interconnected by ducts, which direct the fluid to desired channel.

SELECTOR VALVE—*Electrol, Inc., Kingston, N. Y.* A follow-up selector valve for manual or automatic operation, which is adaptable to mechanical hydraulic systems for maintaining equal tensions, multiple brake actuation, furnace control and other applications, is light in weight and available in sizes to meet specific requirements.



VALVE—*Logansport Machine Co., Inc., Logansport, Ind.* Foot-operated 4-way hydraulic valve, Model 7025, for latching or free control of double-acting hydraulic cylinders is a balanced pressure valve of the sliding-piston type. It is designed without valve seats. Valve comes in standard port sizes from ¼ to 1 in.



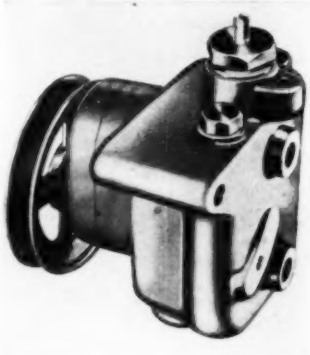
TUBE FITTING — *Flodar Corp., 331 Frankfort Ave., Cleveland, Ohio.* Grip Tube fitting, employing a hardened-alloy spring-steel sleeve, consists of three parts; connector body, tightening nut, and contracting sleeve. Fittings are available in ¼ to 1½-in. sizes in straight, union, elbow, side-tee, tube-tee, and cross type.

FLOW SIGHT — *Oil-Rite Corp., 3486 S. 13th St., Milwaukee 7, Wis.* Flow sight, Style SFX, as a companion to their sight-feed valves, is used for gravity- or pressure-fed lines with flow of liquid downward through a nozzle on the inlet side. The round stream observed is discharged without contacting the transparent sight.

TUBING—*Ronaflex Tubing Co., Inc., Packard Bldg., Philadelphia 2, Pa.* Synthetic body for its tubing utilizes buna and neoprene base synthetics. Standard sizes from ⅛- to 2-in. I.D. and in a range of lengths up to 200 ft. in the small diameter and 50-ft. in the largest diameters are supplied.

PACKING—*Hydraulic Accessories Co., 439 E. Fort St., Detroit 26, Mich.* Hydraulic packing, called Monopak, is used for sealing various liquids and gases throughout a wide range of temperature and pressure. Packing is said to withstand temperatures from —50 to 300 F., and to resist pressures from 0 to 3000 psi.

COUPLINGS—*Roylyn, Inc., 718 W. Wilson Ave., Glendale 3, Calif.* Automatic-sealing couplings listed as the 1300 series, has automatic shutoff upon disconnection and instantaneous flow upon connection. The valve is available in either or both halves of the coupling. Coupling comes in sizes from ¼ to 2 in., in dural, bronze, steel.



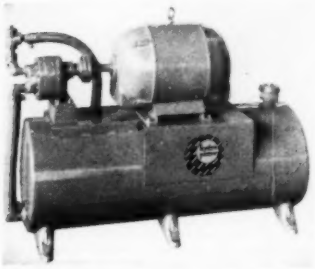
POWER UNIT — *Hydro-Power Div., The Hydraulic Press Mfg. Co., Springfield, Ohio.* Midget-size hydraulic power unit, the Ten-Ton-Tony, can be used on arbor presses and hydraulic clamping vises, and for forming, straightening, and similar operations. It has a capacity of 3 gpm. of oil at 1200 rpm. at 1000 psi.

PLASTIC PIPE—*United States Rubber Co., Rockefeller Center, N. Y.* Corrosion-resistant plastic pipe is made of Kralite, a blend of synthetic rubber and thermoplastic resins. It is supplied in rigid and semi-rigid forms in sizes ranging from ¼- to 2-in. O.D., and can be bent to various radii, and threaded for fittings.

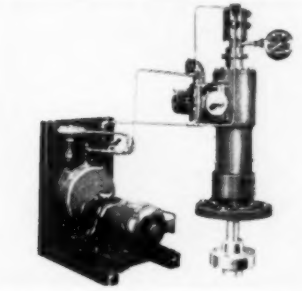
CONTROL CENTER—*Electrol, Inc., Kingston, N. Y.* Control center for hydraulic systems called the Powerpak is capable of exerting precision-controlled forces by finger-tip actuation from zero to a maximum operating pressure of 1500 psi. It consists of a hand pump, reservoir, two selector valves, and relief and check valves.

TUBE FITTING—*Scovill Mfg. Co., Waterbury 91, Conn.* Self-flaring, leak-proof tube fitting can be taken apart and reconnected many times. Called the Uniflare, the fitting has two parts, body and nut. Fittings are made in a complete range of sizes and shapes for use with copper, aluminum, monel and annealed steel tubing.

POWER UNIT — *Jerome Hydraulics Co., 60 Ocean Ave., Lynbrook, N. Y.* Fluid power unit, Model No. 1100 Pack O'Power, is adaptable to single cylinder, gravity or spring return applications requiring to 1½ hp. intermittent-duty rating.



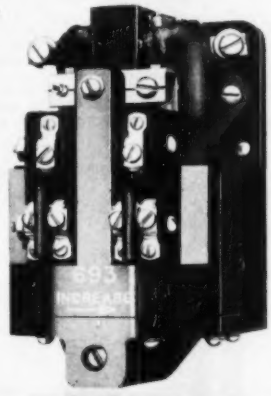
POWER UNITS—*The Hydraulic Press Mfg. Co., Mount Gilead, Ohio.* Packaged hydraulic power units called the Cubline, are for application where forming, bending, straightening, pressing, lifting, pulling, and lowering are operating factors. Three capacities are available, 6, 10, and 15 gpm.



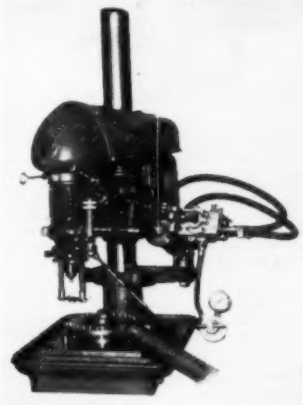
HYDRAULIC-DRIVE SYSTEM—*Hydraulics Division, of Rockwell Manufacturing Co., Pittsburgh 22, Pa.* The hydraulic system uses pumps and motors as the hydraulically coupled activating mediums. Hydro-syn governing system is used to maintain any predetermined condition of speed, torque, pressure, volume or liquid level.

CYLINDERS—*Modernair Corp., 4222 Hollis St., Oakland 8, Calif.* Cushion-type cylinders for air operation are available with adjustable cushion units, enabling application where it is necessary to vary the speed of the cushion stroke. A variety of interchangeable mounting brackets are available.

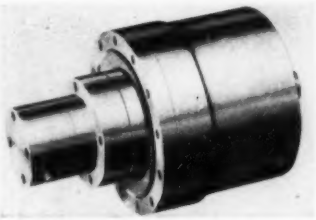
AIR-LINE-JOINT — *Universal Air-Line Joint Mfg. Co., Lafayette, Ind.* Universal air-line-joint directs and maintains a jet of liquid or air to any point or object in a machine operation. Its use is said to eliminate the frequent adjustment necessary when using make-shift pipe-fitting assemblies or semi-rigid tubing.



PNEUMATIC TIMER—*Cutler-Hammer, Inc., 205 North 12th St., Milwaukee, Wis.* Ac. pneumatic timer, designed for use on machine tools, conveyors, or automatic-processing equipment, is 2¾x7¾ in. high. Timing range is from 0.3 sec. to 3 min.



AIR DRIVE—*Cinema Tool, 331 West 27th St., New York 1, N. Y.* Reciprocating air drive is offered. A drillpress can be tooled with dial feeds or comparable devices, and is then said to be capable of 20,000 cycles in a working day. Control is said to be sensitive enough to drill 0.0225-in. holes.

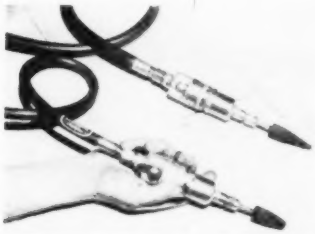


AIR CYLINDERS—*Cushman Chuck Co., Hartford 2, Conn.* High-speed air cylinders for power-chuck operations are aluminum-alloy forgings and are finished with lapped bores for air seal. Cylinders are available in 4½-, 6-, and 8-in. sizes, and perform at speeds to 3500 rpm.

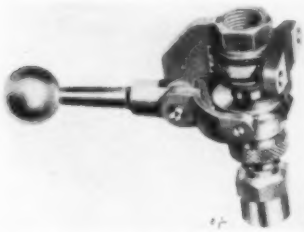
AIR-CYLINDER CONTROL—*Numatics of Milford, Mich.* Individual-control units for control of air cylinders are applied directly to cylinder heads. Control units are full-capacity 3-way valves and are screwed into the pipe connections of any air cylinder. Units are available in pipe sizes, of ⅛, ¾, and 1 in.

AIR CYLINDER—*The James L. Entwistle Co., 43 Church Street, Pawtucket, R. I.* Standard-use, low-cost air cylinder is available in standard-bore sizes from 1½-in. to 10-in. dia., and can be made to any stroke specified. Top operating pressure is 110 psi.

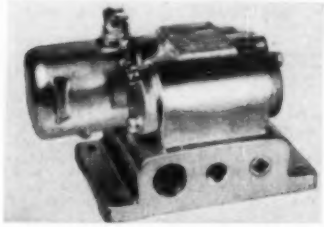
AIR CONTROL — *Bendix-Westinghouse Automotive Air Brake Co., Elyria, Ohio.* Robotair industrial air controls, featuring a frictionless air chamber has a diaphragm with a minimum-service life of 1,000,000 applications. A valve permits regulation of air pressures from 0 to 80 lb. by manipulating a lever with rheostat graduation.



AIR HOSE—*The B. F. Goodrich Co., Akron, Ohio.* Air hose for small tools called Highflex, is said to be as flexible as a lamp cord because of its light weight and construction features. Hose in the ¼-in. size weighs 8.8 lb. per 100 ft.



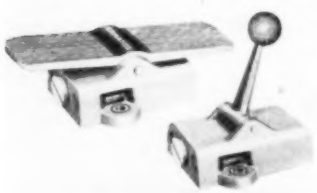
VALVE — *C. E. Hunt & Son, Inc., Salem, Ohio.* A 3-way neutral-position hand-operated valve, No. 1291-N3, called the Quick-As-Wink valve, is fitted with a flat spring for indexing and holding the handle in on, off, hold, or neutral position. Units are furnished in ⅜ and ½-in. pipe sizes for air pressures up 250 psi.



AIR VALVES—*Viking Products Co. Inc., 2373 E. Eight Mile Road, Hazel Park, Mich.* Line of solenoid-operated ring-seal air valves, uses a single interchangeable valve assembly. The interchangeable valve assembly is used in all valves up to ¾ in. and larger whether three-, or four-way, and whether three-, four-, or five-port.

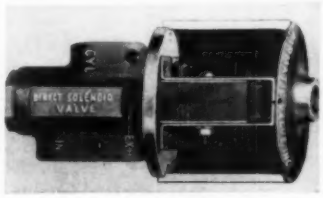
VALVE—*Carpenter Mfg. Corp., 9523 Detroit Ave., Cleveland, Ohio.* Bulldog needle valve built with a stainless-steel stem, features a long taper. For flow control, a micrometer thread is machined on the stem with 40 tpi. Control is held to 0.0001-in. accuracy.

VALVE—*Valley Tool Co., 5515 E. Slauson Ave., Los Angeles 22, Calif.* Three-, four-way air-control valve for air cylinders is called the Master air-control valve. The balance piston does not require a lapped fit. Sizes from ¼- to 1-in. pipe size are available.

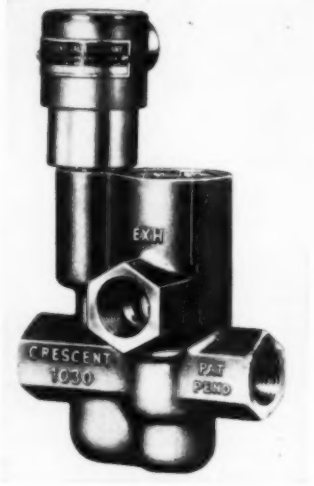


VALVES—*Airmatic Valve, Inc., 1643 E. 50th St., Cleveland, Ohio.* Two noncorrosive hand- and foot-controlled valves, Model HF-3 (3-way), and Model HF-4 (3-way), have precision-machined internal parts and are designed for locking or non-locking with neutral. Air controlled valves are available in ¼-in. size.

AIR VALVE—*Mead Specialties Co., 4111 N. Knox Ave., Chicago 41, Ill. Dept. FT-4.* Three-way air valves listed as F1-101 and FC-101 have minimum openings of 5/16-in. throughout. They are fitted with hose nipples to take ⅜-in. I.D. and up to ¾-in. O.D. hose.



VALVE—*Airmatic Valve, Inc., 1643 E. 50th St., Cleveland, Ohio.* Non-corrosive, full-capacity, 3-way direct-operating solenoid-controlled valve, Model DS-3, eliminates pilots, levers and other types of indirect control. Unit is rated at 1.42 amp. inrush, and comes in four standard pipe sizes ¼, ⅜, ½, and ¾ in.

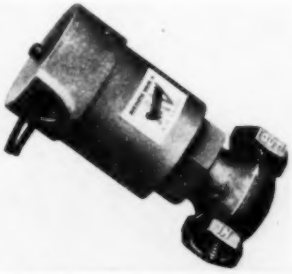


VALVE—*Crescent Valve Co., 6073 State St., Huntington Park, Calif.* 3-way fast-acting pilot-actuated solenoid-controlled valve for air, water and light oils, listed as Model 1030, is available for either "normally open" or "normally closed" operation. Valve is designed for pressures from 25 to 140 psi.

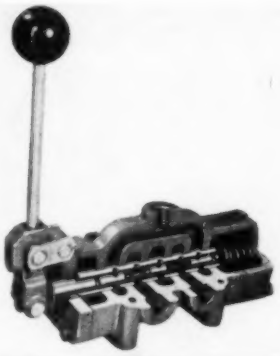
AIR VALVE—*Paul Valve Corporation, 683 Third Ave., New York 17, N. Y.* Springless, packless air valve for any line up to 100-psi. pressure is available in ⅛- or ¼-in. hose sizes, both with bodies tapped for standard ¼-in. pipe threads. Nozzle extends approximately 2½ in.

FLOW-CONTROL VALVE — *Pneutrol Devices, Inc., 3122 N. California Ave., Chicago 18, Ill.* Flow-control valve for air- or hydraulic-cylinder speed control is designed to provide accurate control of cylinder speed as well as unrestricted flow from the cylinder. Valve is made in ¼-, ⅜-, and ½-in. pipe sizes.

AIR-CONTROL VALVE — *Hannifin Corp., 1101 S. Kilbourn Ave., Chicago 24, Ill.* Electrically operated 4-way valve for directional control of flow of compressed air provides a fast-acting push-button control for small, air-operated presses. Valve is offered in three models with ⅜-, ½-, and ¾-in. dia. inlet and cylinder connections respectively.



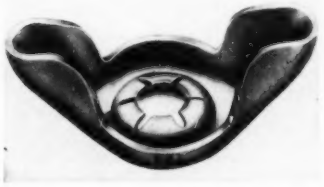
SOLENOID VALVE—*Airmatic Valve, Inc., Cleveland, Ohio.* Model DS-2 direct-operated solenoid valve needs no pilot or other medium for operation. Effective orifice area is equal to that of the pipe line. Valve is available in sizes of ¼, ⅜, ½, ¾, 1, 1¼, 1½, 2, 2½, and 3 in.



SELECTOR VALVE—*Adel Precision Products Corp., Burbank, Calif.* Hydraulic 4-way selector valve is designed for 1000-psi. pressure for control of one double-acting cylinder, or two single-acting cylinders. Valve is offered in a variety of models in ¼-, ⅜-, ½-, ¾-, and 1-in. pipe-thread port sizes with flow to 32 gpm.

RETAINING RING—*Ramsey Corp., St. Louis, Mo.* Spirolox retaining rings, in all sizes, positions and locks moving parts such as pinions, bushings, and bearings, on shafts in housings, eliminating nuts, caps, and other locking and positioning parts.

ELASTIC STOP NUT—*Elastic Stop Nut Corp. of America, Union, N. J.* High-tensile, double-hex nut (ESNA Type EE), is designed to develop 185,000 psi. minimum in NAS high-strength aircraft bolts where weight and space limitations are major factors. It is interchangeable with existing internal wrenching nuts. Nut is available in sizes ¼ in. through 1⅛ in. in National fine thread series.



WING NUT—*The Palnut Co., 81 Cordier St., Irvington, N. J.* Self-locking wing nut employs the same type of thread engagement used in other Palnuts made by the company.

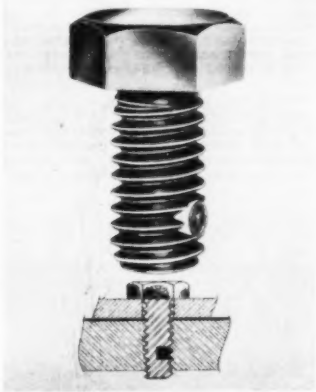
PLATE-TYPE FASTENERS — *Armstrong-Bray & Co., Chicago, Ill.* Plate-type fasteners for heavy-duty conveyor belts, called Plategrip belt fasteners, pull belt ends together into a smooth, flexible joint. They are made of heavy-gage steel and are designed so that they will withstand any load the belt can safely carry. They are provided for belts from ¼- to 1½-in. thick.

INTERNAL WRENCHING NUT—*The Allen Mfg. Co., Hartford 1, Conn.* Self-anchoring internal wrenching nut is made for use with Allen hex-socket screws. Nut is designed to set up flush to produce smooth surfaces. It is locked by knurled flutes being drawn down into counterbored hole as screw is tightened. Nuts come in sizes from No. 4 to 1 in.

TUBULAR RIVETS—*Gries Reproducer Corp., 780 East 153rd St., New York 54, N. Y.* Zinc-alloy tubular rivets are suitable for applications not requiring the maximum strength of steel or brass. Rivets come in oval-head sizes from 1/16 to 9/64 in. in diameter, and flat countersunk heads in 9/64-in. size.

MACHINE BOLT — *Bovar-Schultz Corp., 2110 Walnut St., Chicago 12, Ill.* A 1-in. alloy-steel special machine bolt is threaded to a close fit and has a rust-resisting finish. Nuts of special-alloy steel are threaded to match bolt threads.

LOCK NUT, WELD NUT COMBINATION — *Grip Nut Co., 310-C South Michigan Ave., Chicago 4, Ill.* Gripco combination weld nut and lock nut is a 3-point projection weld nut. It reaches the bottom of the nut counterbore about ¼ of the way through, causing the metal particles to fall on the counterbored portion, which slants outward, instead of on the threads.

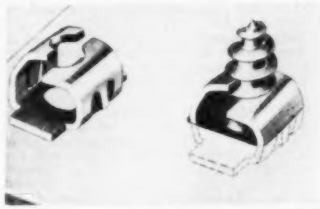


SELF-LOCKING CAPSCREW — *Diamond Head Screw Corp., 6715 Hollywood Blvd., Los Angeles 28, Calif.* It is a standard capscrew with a built-in locking feature consisting of a nylon insert set into one side of the threaded segment.

BOWED E-RING—*Waldes Kohinoor, Inc., 47-16 Austel Place, Long Island City 1, N. Y.* Bowed E-ring is for accurate positioning of a series of gears and spacers used in counter gear assemblies. The Waldes Truarc bowed "E" retaining ring is a three-prong ring bent like a bow out of its plane at about its horizontal center line.

WASHER—*George K. Garrett Co., 1521 Chestnut St., Philadelphia, Pa.* Aluminum spring-lock washer for use in all types of light-metal assemblies, is called the Diamond G washer. The corrosion-resistant washer is available in standard and special sizes.

FASTENER—*Dzus Fastener Co., Inc., Babylon, N. Y.* The Supersonic fastener for use in high-speed aviation work is designed to meet the requirements of specification AN-F-8b of the Air Force-Navy. Fasteners are available in all sizes.



NUT FASTENER — *Prestole Corp., 3155 Bellevue Road, Toledo 6, Ohio.* Spring-steel snap nut for blind-location sheet-metal assembly is offered for nut-to-panel anchoring in blind attachments and is said to provide features previously only obtained with complex floating-type fasteners. No welding, riveting, clinching or special tools are necessary.

SPECIALTY STEEL — *Amalgamated Steel Corp., Newburgh Mill District, Cleveland 5, Ohio.* Toolroom specialty steel, T. R. S. steel, can be quenched in oil, water, or salt bath, giving almost any degree of hardness. The steel is available in various sizes, and is said to have toughness and strength.

HIGH-SPEED STEELS—*Latrobe Electric Steel Co., Latrobe, Pa.* Line of high-speed steels called the Electric MV high-speed steel group, is distinguished by its chromium, molybdenum, and vanadium content with no tungsten present in the steels. Applications include small drills and reamers.

COLD-ROLLED STEEL—*The Cold Metal Products Co., Youngstown, Ohio.* Bright-annealed cold-roller strip is now available in the 18-8 analysis. Chrome-nickel steels in dead-soft annealed temper can be furnished in a bright, mirror finish without expensive buffing or polishing. Steel is offered in widths to 7½ in., and in thicknesses 0.001 in. and heavier.

CORROSION-RESISTANT STAINLESS — *The Carpenter Steel Co., Reading, Pa.* Corrosion-resistant stainless steel is available in wrought forms such as bar stock, wire, strip, tubing and pipe. Known as Carpenter Stainless No. 20, it is said to retain the good mechanical properties of 18-8 stainless steels. Featured is steel's resistance to hot sulphuric acid.

METAL — *Kennametal Inc., Latrobe, Pa.* This hard metal is said to retain its strength and resistance to corrosion at high temperatures. It is a cemented-carbide composition. Called Grade K138, it is made in accordance with Kennametal's processes of powder metallurgy, and can be formed into many shapes and sizes.

BARE BRONZE WIRE—*Ampco Metal, Inc., 1745 South 38th St., Milwaukee, Wis.* Bronze bare wire for submerged arc-welding listed as Ampco-Trode 10, is produced for applications where it is more economical to apply deposits of this grade of Ampco-Trode over large areas by an automatic process. It is supplied in coils in ⅛-in. and 3/16-in. diameter sizes.

BRONZE-BASE ALLOY—*John Hewson Co., 70 Wall St., New York 5, N. Y.* Low-temperature, bronze-base alloy for permanent repairing, called "Lo-Temp", handles like putty at 300 F. and can be machined at room temperatures.

PLATED ALUMINUM — *American Nickeloid Co., Peru, Ill.* Nickel- and chrome-plated aluminum is offered in sheets only, in sizes up to 36x96 in., in a range of tempers and gages. Soldering of the plated aluminum is possible.

HIGH-SILVER ALLOY — *Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* High-silver alloy listed as Eutecrod 1700, is designed for stainless steel, copper, brass, bronze, tungsten carbide and steel. It is said to be a thin-flowing high-silver alloy.

ALLOY—*General Electric Co., Chemical Dept., Pittsfield, Mass.* Alloy of tungsten, copper, and nickel called Hevimet possesses a density 50% greater than lead, giving it qualities applicable to the design and construction of moving parts possessing maximum inertia and minimum size.

ALUMINUM-BRONZE ALLOY—*Ampco Metal, Inc., Milwaukee 4, Wis.* Aluminum-bronze alloy for use in forming and drawing dies, listed as Ampco Metal Grade 24, is said to possess hardness coupled with high compressive strength and wear-resistance.

SPRAY — *Metallizing Engineering Co., 38-14 30th St., Long Island City 1, N. Y.* Metal which can be sprayed directly on to smooth, or highly polished steel and other materials without surface preparation, is called Metco Sprabond.

CARBIDE SINTERED ALLOY — *Carbide Alloys Div., Allegheny Ludlum Steel Corp., Pittsburgh 22, Pa.* Sintered-carbide alloy, designed for high-speed planer tools, Carmet Grade CA-51, is available for planers using either the clamped-in or brazed-type blanks.

MATERIAL—*Resistoflex Corp., Belleville, N. J.* Material unaffected by fuels, oils and other organic solvents is called Compar. It is light in weight, possesses a high tensile strength, and has a high resistance to wear and abrasion.

SILICONE-RUBBER PRODUCTS—*General Electric Co., Chemical Dept., Pittsfield, Mass.* Silicone rubber-coated glass cloth which will withstand operating temperatures as high as 520 F., an adhesive for bonding silicone rubber to itself, metals and ceramics, and other applications for molded and extruded materials, are introduced to the silicone-rubber field.

RUBBER STOCK — *Felt Products Mfg. Co., 1504 Carroll Ave., Chicago 7, Ill.* Synthetic rubber material, Fel-Pro 131, is said to process a tensile strength of 1800 psi. and low compression set after extensive immersion in various fuels, oils, and solvents, and also to have a high temperature resistance (300 F. in hot oil).

RUBBER TUBING — *Ronaflex Tubing Co., Inc.; distributed by Peneflex Sales Co., 7200 Powers Lane, Philadelphia 42, Pa.* Flexible tubing said to have the flexibility of rubber and the sturdiness of steel can be bent and twisted, yet provides free-flowing transmission of air, water, gases, oil and volatiles.

THERMOPLASTIC—*M. W. Kellogg Co., Jersey City, N. J.* Kel-F, a stable high-temperature thermoplastic in its natural state is colorless and transparent, although it can be blended with solid fillers and coloring agents.

MOLDING—*Rohm & Haas Co., Washington Square, Philadelphia 5, Pa.* Medium-flow acrylic molding powder listed as Plexiglas VM, is an acrylic powder said to combine the injection-molding properties of Plexiglas F with the sparkling clarity characteristic of the heat-resistant Plexiglas V.

THERMOPLASTIC MATERIAL — *United States Rubber Co., Rockefeller Center, N. Y.* Thermoplastic material known as Versalite, is tough, light in weight, non-corrosive and stable under changing atmospheric conditions, and has electrical insulating properties, and a low rate of heat conductivity.

POWDER—*Myler Plastic Corp., 92 Bishop St., Jersey City 4, N. J.* Gladite, a plastic cold-molding powder, is a free-flowing powder, which molds in all colors without preheating, preforming or after-baking and eliminates finishing.

SAWDUST—*Michael Wood Products, Inc., 625 Midland Ave., Dept. MF, Garfield, N. J.* Kube-Kut sawdust for drying and polishing metals and other materials is made from green-maple sawdust at logging operations. It is available in different types of meshes and is packed in 50-lb. bags.

RELEASE AGENT—*General Electric Co., Waterford, N. Y.* GE silicone oil is used as a mold-release agent in the injection molding of aluminum and zinc die-castings. Oil used in emulsion form is said to facilitate production of certain type die-castings and to help provide a smooth surface on the finished parts.

PAINT REMOVER—*Kelite Products, Inc., Box 2917, Terminal Annex, Los Angeles 54, Calif.* Paint remover penetrates paint by inhibiting evaporation. It is effective for outdoor use because of its slow-drying quality. Called Kelite paint lift, material is claimed safe for all metals and contains no phenolic compounds.

SYNTHETIC ENAMEL — *The Sherwin-Williams Co., Cleveland, Ohio.* Synthetic enamel finish can be used in place of porcelain for many applications. Called Superclad, the finish is resistant to alkalies and acids.

ZINCILATE COATING — *Industrial Metal Protectives, Inc., Dayton 2, Ohio.* Zincilate coatings available in two new types are said to be anti-corrosive. They will airdry without baking, and are sufficiently flexible so that sheets, pipes and forms can be bent double without breaking the coating.

ZINC ANODE — *Wagner Bros., Inc., Detroit, Mich.* Flat-top zinc anode is for use in electroplating. Shape is retained through process, so that a glance at the anode basket will identify the zinc tank. Anode's surface is said to be free from gates and flash.

FINISH—*Acryvin Corp. of America, Astoria, L. I.* Finish to be used on ferrous and non-ferrous metals called Acraclad, is a one-step finish eliminating chemical and mechanical surface pre-treatments. Pre-cleaning and de-greasing are the only necessities. Quick baking requires a max. of 10 min. at temperatures ranging from 250 to 350 F.

METAL LACQUER—*Dennis Chemical Co., 2701 Papin St., St. Louis, Mo.* Metal lacquer for use where oil resistance, toughness and adhesion are required, listed as No. 5062, is said to adhere to a variety of metal surfaces and has found particular application over Cronak-treated metals. A complete line of colors is available.

RESINS, VARNISHES—*The General Electric Chemical Dept., Pittsfield, Mass.* Four grades of GE phenolic liquid resins and two grades of phenolic varnishes are thermosetting plastics which condense on heating to form insoluble, infusible materials useful in a variety of laminating, impregnating, and binding applications.

PAINTS — *Morton Chemical Co., Greensboro, N. C.* Duramite line of chemically inert paints and coating materials, offers good adhesion and heat resistance. Acids, alkalies, and most corrosive materials are said to have no effect on these products.

COLD SOLVENT MATERIAL—*Oakite Products, Inc., New York, N. Y.* Cold solvent material, Oakite Composition No. 15, is designed to permit fast, thorough removal of paint and similar finishes from metal surfaces. Composition may be applied at room temperature by tank immersion methods by swabbing or brushing.

CLEANER—*Schaffner Industries, Inc., Pittsburgh 2, Pa.* Waterless cleaner removes grease, dirt, paint and other substances without irritating the skin of the hands. Called "Little Doc" Disolvit, lanolin, a soothing substance, is contained in the ingredients.

CLEANER—*Apothecaries Hall Co., Waterbury 88, Conn.* AhCOloid emulsion cleaner can be used on all metals and is especially desirable for cleaning buffed zinc-base die castings or aluminum parts which would be stained by prolonged immersion in alkali cleaners.

CLEANERS — *Hanson-Van Winkle Munning Co., Matawan, N. J.* Group of cleaners cover range of application. Among them is No. 20-W, a mild non-etching cleaner containing a synthetic wetting agent and an effective water softener. It is primarily a soak cleaner for aluminum.

CLEANER—*Oakite Products, Inc., 124 Thames St., New York 6, N. Y.* Emulsifiable-solvent cleaner that dilutes with water, listed as Composition No. 97, forms water emulsions suitable for spray applications in single- or multi-stage metal-washing machines.

ACID AGENT—*Enthone, Inc., Dept. AM, New Haven, Conn.* Additive called Actane is used in acid dips prior to plating. Its function is to disperse and remove colloidal films from the surface of metals that may be deposited during cleaning.

SOLVENT—*Swan-Finch Oil Corporation, 1248 Avenue of the Americas, New York, N. Y.* Sludge and gum solvent called the "Hydro-Solv A," can be added to regular hydraulic oils to overcome sluggish operation caused by contaminants.

ACID INHIBITORS — *Hanson-Van Winkle-Munning Co., Matawan, N. J.* Surbrite S and Surbrite H, acid inhibitors, are added to sulfuric, and hydrochloric acid pickling solutions, and have the ability of wetting or lowering surface tension and to cause the pickled steel to develop a bright, smut-free surface.

COPPER-BRIGHT SOLUTION—*Rossaul Co., 119 W. 63rd St., New York 23, N. Y.* A solution for bright dipping of copper and copper alloys is called Copper-Brite. Solution removes oxides and is said to leave metal bright, resistant to future tarnish or discoloration, and not to discolor silver solder.

CLEANER—*Chemical Research Laboratories, Oakite Products Inc., New York, N. Y.* Process for cleaning brass, copper and copper alloys, such as nickel silver and monel metal prior to electroplating uses combined solutions of Oakite Composition 91 and Oakite Composition 91A.

CLEANERS—*Oakite Products, Inc., 124 Thames St., New York 6, N. Y.* Chemical material for cleaning and deodorizing in one operation called Di-Sanite, is a fine, free-flowing powder. Material is soluble in hot or cold water and is said to possess wetting, penetrating, and detergent ability, as well as deodorizing action.

EMULSION CLEANER — *Northwest Chemical Co., 9310 Roselawn Ave., Detroit 4, Mich.* Alkali emulsion cleaner for removing oils and tallow-based drawing compounds, cleaner SC-9 contains a petroleum derivative to control foam and the formation of rust.

MULTI-PURPOSE GREASE — *Freedom-Valvoline Oil Co., Freedom, Pa.* Valvoline X-5 multi-purpose grease can be used as a general lubricant and changes very little in body up to 400 F. Offering a special metallic soap base, it does not combine with water and is water resistant.

PENETRATING OIL, FLUXES—*Sulfo, Inc., 1143 E. Jersey St., Elizabeth 4, N. J.* The expanded line is known as the Sulfo Quality Line and includes solder fluxes, pipe-joint compounds, penetrating oil, layout liquid, and a new all-purpose cutting compound.

COMPOUND FOR DRAWING STEEL —*Northwest Chemical Co., 9310 Roselawn, Detroit 4, Mich.* Heavy-duty compound for drawing steel can be used without dilution; however, it can be thinned up to two parts of warm water, by volume, to one of the compound. Called Super-Draw M-106, it is low in pigment and is homogenized.

OIL MIXER—*Alemite Div., Stewart-Warner Corp., 1826 Diversey Pkway., Chicago 14, Ill.* Soluble oil mixer proportions water and soluble oils and transfers the product into another container. Water pressure, the only power necessary, must be from 24 to 30 psi.

PACKING — *Quaker Rubber Corp., Philadelphia 24, Pa.* Packing, used for sealing piston rods, resists vibration produced by drop-forge hammers. Called Daniel's P.P.P. Special No. 183, the packing is available in coil form and ranges in size from 3/16 to 1¼ in. in multiples of 1/16 in., and from 1¼ to 3 in. in multiples of ⅛ in.

TAP CARTRIDGES—*The Foulk Mfg. Co. 4208 Airport Rd., Cincinnati, Ohio.* Tap cartridges are wax slugs placed in blind holes before tapping. When tapping, cartridge is extruded up along the flutes of the tap carrying the chips out of the hole.

LIQUID WAX—*S. C. Johnson & Son, Inc., Racine, Wis.* Liquid wax for use as a lubricant in the manufacture of metal items by the impact-extrusion process listed as Johnson's LW No. 20 wax, can be applied to slugs before extrusion by dipping or tumbling.

ALL-ADHESIVE TAPE—*Minnesota Mining and Manufacturing Co., St. Paul, Minn.* Adhesive provides a metal-to-metal bond that is resistant to shear tests up to 3500 psi. The "Scotch-Weld" bonding film is marketed in rolls like tape. Bonding is accomplished by placing adhesive between metal units and curing the assembly with heat: 300 to 500 F. for 5 to 10 min.—and pressure—25 to 50 psi.

INSULATING TAPE — *Hanson-Van Winkle-Munning Co., Matawan, N. J.* Improved Wrap-Rax masking and stop-off tape with thermal and chemical resistance is heated after application to 300-325 F. to insure adhesion at each lap of the winding.

LIQUID ADHESIVES—*General Electric Chemical Dept., Pittsfield, Mass.* Two modified phenolic liquid adhesives for cementing metals and thermosetting plastics are known as No. 12507 and 12508. GE adhesive No. 12507 is said to have good solvent resistance and is recommended for thermosetting plastics. Adhesive No. 12508 is offered for application necessitating high cleavage strength.

SYNTHETIC-RESIN TAPE—*Hanson-Van Winkle-Munning Co., Matawan, N. J.* Orange-colored Wrap-Rax, a synthetic resin in tape form for insulating plating racks is effective as a stop-off in hard chromium and other plating solutions. Wrap-Rax chemically resists all cleaning, pickling and plating solutions commonly used.

ADHESIVE—*General Electric Chemical Dept., Pittsfield, Mass.* Adhesive for bonding silicon rubber to itself and to glass, metals, and ceramics is known as GE adhesive No. 12509, and is said to remain flexible and resilient over temperatures ranging from -70 F. to 520 F., and to withstand continuous temperatures of 300 to 350 F. in a dry air-circulating oven.

PROTECTIVE COATING—*American Chemical Paint Co., Ambler, Pa.* Surface-treating chemical for aluminum produces a protective coating. Called Alodine, the chemical can be applied by dipping, spraying in a power washer, or brushing the aluminum part.

LIQUID PLASTIC—*Enthone, Inc., 442 Elm St., Dept. AM, New Haven, Conn.* Liquid-plastic plating-rack coating called Enthonite 101, is supplied as a viscous liquid containing 100 percent solids, which is applied by dipping to produce coatings varying in thickness from ⅛ to ¼ in.

LAMINATED RUBBER-CORK MATERIAL — *Korfund Co., Inc., 48-15 32nd Place, Long Island City 1, N. Y.* Elasto-Rib, a laminated rubber-cork material for vibration and noise control is composed of a layer of cork bonded between two layers of deep-grooved oil-resistant synthetic rubber.

CORROSION INHIBITOR—*Charles Stevens & Co., 2018-24 Crotona Parkway, New York, N. Y.* Synthetic-chemical corrosion inhibitor slowly vaporizes and surrounds ferrous material such as iron and steel, preventing corrosion by moisture and air. An odorless invisible protective film is formed. Listed as CS-CI-501, vapor does not have to come in contact with the metal directly for protection.

COATING—*Watson-Standard Co., 225 Galveston Ave., Pittsburgh 12, Pa.* Protective coating for metal parts which can be peeled off after it has served its purpose is called Peelcote. It can be applied by spray or dip methods. Peelcote is a vinyl-based coating and is available in clear transparent or solid hiding black.

RESIN SEALANT — *Western Sealant Co., Culver City, Calif.* Resin sealant for reducing losses due to porosity in pressure castings is adaptable to two methods of applications.

COATING — *Detrex Corp., Box 501, Detroit 32, Mich.* Coating compound for use on the walls of paint-spray booths called Triad PRD, it is a light-colored, semi-liquid material that can be applied with a brush or spray gun.

COATING—*Kano Laboratories, 75 East Wacker Drive, Chicago 1, Ill.* Rust-preventive coating which can be applied cold by dipping, spraying, or brushing, and which forms a clear film on metal surfaces, dries in about 15 min. to a clear, hard surface. It is said to be tough, flexible and non-porous.

COATING — *Whitman Co., 1407 Esperanza St., Los Angeles 23, Calif.* Insulative coating for preventing spalling action, resisting heat penetration and decreasing carbon, slag, and clinker adherence, called Vitroseal, forms a semi-glazed protective monolithic wall of from 8.5 to 9 hardness between fire and fire brick.

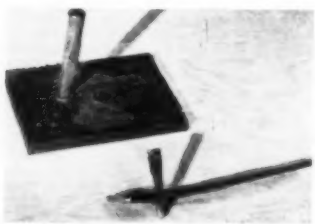
LIQUID COATING—*State Chemical Corp., 1265 Broadway, New York 1, N. Y.* Transparent liquid skin for protection from corrosion and deterioration called Permacote, forms a tough transparent surface which is flexible. Product is also resistant to extremes in temperatures.

TRANSLUCENT COATING—*The Skybryte Co., 3125 Perkins Ave., Cleveland, Ohio.* Light-blue translucent material, Sky No-Glare, is brushed or sprayed on windows and skylights and is said to admit 94% light and reduce heat 15%. It costs less than ½ cent per sq. ft. of glass.

SEAL—*Dura Seal, Type PS, is offered by Durametallic Corp., 2104 Factory St., Kalamazoo 24F, Mich.* High-pressure non-lubricated sealing Type PS can be used for light hydrocarbons in the 600-lb. pressure range. No added lubricating system is needed. It can be installed on practically any type of pump, mixer, or like equipment having a rotating shaft.

PLASTIC SPRAY — *Foster & Kester Co., Inc., Philadelphia, Pa.* Plastic spray resists rust and tarnish. Called Krylon, the transparent plastic coating is supplied in a self-contained compact sprayer. The spray is released by pressing a button on the top of the can with the index finger.

WATER-EMULSION WAX—*S. C. Johnson & Son, Inc., Racine, Wis.* Water-emulsion wax, used as a rust-inhibiting coating for metals known as Johnson's wax No. 1568, is applied by dipping, spraying, wiping or flow-coating. The emulsion forms a dry wax coating on the metal part that checks corrosion.



HARDENING COMPOUND—*Necamp Metallurgical Laboratories, 1 Mercer St., New York 13, N. Y.* Deep penetration hardening of cutting tools, dies, taps, drills, reamers—and low-carbon cold-rolled and machine steels—is possible with Hi-Speed-It, a powder-form steel-hardening compound.

ISOLATING PASTE—*Denfis Chemical Laboratories, Inc., 172 Pacific St., Brooklyn 2, N. Y.* Paste will keep part of workpiece soft while the rest is carburized. Known as Isopac, the paste can be applied to work regardless of the method of carburization that is used.

PACK-HARDENING PASTE—*Denfis Chemical Laboratories, 172 Pacific St., Brooklyn 2, N. Y.* Method of case hardening does not require special equipment. A pack-hardening paste known as Carburit is applied to the sections of the work to be hardened. The remainder of the work will remain soft.

RUST-PREVENTING COMPOUND—*Sinclair Refining Co., 630 Fifth Ave., New York 20, N. Y.* Rust-preventing compound, known as RD-9, is now being added to all Sinclair petroleum products as they flow through pipe lines to distribution points.

REFRACTORIES — *Johns-Manville Corp., New York 16, N. Y.* Two new castable refractories, 3X Firecrete and 3X Blazecrete, are for service temperatures up to 3000 F. The use of these fast air-hardening refractories is claimed to offer substantial savings in furnace construction costs because of their adaptability for application by casting, gunning and troweling.

COLOR-BUFFING COMPOSITION—*The Hanson-Van Winkle-Munning Company, Matawan, N. J.* Bar composition designated as 6-B-72, is for color buffing carbon steel, stainless and chromium plate. Composition has a binder that retains the abrasive on the buff face.

V-BELT—*Manhattan Rubber Div., Raybestos-Manhattan, Inc., Passaic, N. J.* Ray-Man V-belt was developed for use on tough, rugged drives. Belt is said to possess oil, heat and static resistance.

PLASTIC DECALCOMANIA—*Christman Engraving Co., Battle Creek, Mich.* Christman plastic decal is a decalcomania for specialized applications on plastic surfaces, sheetings, baked synthetic enamels, wrinkle finishes, leatherette, leather, and synthetic fabrics.

PACKAGING PROGRAM— *Manheim Mfg. & Belting Co., Manheim, Pa.* Improved packaging program for Veelos, the link V-belt is announced. Reels come in individual cartons which shows the size and type V-belt.

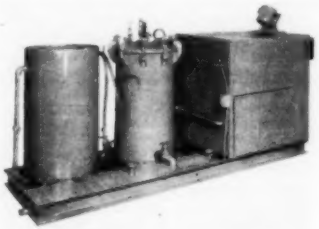
CHEMICALLY TREATED CLOTH—*E. I. duPont de Nemours & Co., Inc. Wilmington 98, Del.* Absorbent-cotton cloth is treated with a chemical solution to end fog on windows and eyeglasses. Cloth is soaked with an anti-fogging agent and then dried. Treated cloth can be used indefinitely.

BRAZING PROCESS—*The Industrial Heating Div., General Electric Corp., Schenectady 5, N. Y.* Process is offered for brazing stainless steels in a hydrogen atmosphere. Atmosphere process is said to make possible the joining of precision, high-temperature stainless-steel parts.

COLOR PROGRAM—*The Carpenter Steel Co., Reading, Pa.* Color program simplifies tool-steel identification. Bars of matched tool and die steels are now painted full length. A wall-chart will be a further aid to selection and identification.

COATING — *The Technical Processes Div., Colonial Alloys Co., Philadelphia 29, Pa.* Anonizing process is an immersion method of protecting aluminum surface and maintaining its natural color. The transparent, oxide coating resembles a clear glaze though not brittle. Coating can be used as a base for paint.

ANODIZING ALUMINUM RIVETS—*Colonial Alloys Co., Ridge Ave. & Crawford St., Philadelphia 29, Pa.* Improved process for anodizing and coloring aluminum rivets, screws, and similar items is said to be of special use where the heads of the rivets are decorative. The protective, non-smutting coating is said to be hard; abrasion and corrosion resistant.



MOGULIZER — *Metallizing Co. of America, 3520 West Carroll Ave., Chicago, Ill.* Combination vacuum and pressure unit for eliminating porosity in pressure castings, The Model 30 mogulizer, uses a special metallic impregnating solution known as Mogul Cast Seal Type B. The top portion of the square tank is a 54-gal. supply container.

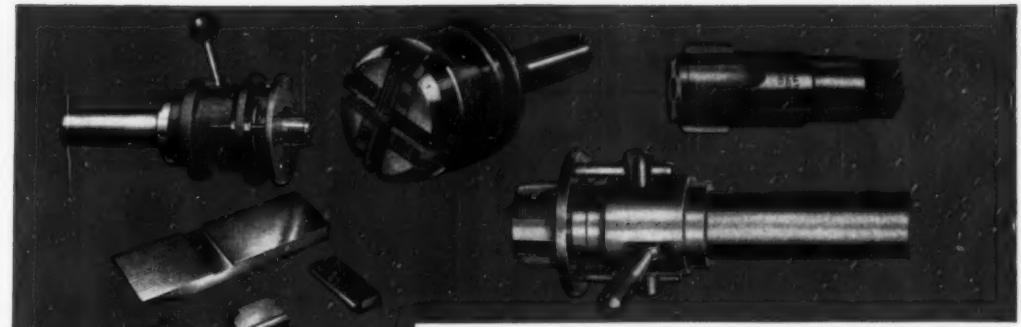
NAMEPLATES—*Dayton Rogers Mfg. Co., Minneapolis, Minn.* Process for obtaining a limited number of die-cut profile custom-made nameplates for industrial equipment without the usual die cost produces them in any size or type. The maximum over-all length is 36 in., with a letter height up to 3 in.

BRAZING MAGNESIUM — *Dow Chemical Co., Midland, Mich.* Process for brazing magnesium is offered. Furnace, flux-dip, and torch-brazing methods are applicable to magnesium. A flux must be present to free surfaces from oxide or other films to permit capillary flow.

CHROMIUM PLATING—*The Midwest Chrome Process Co., 83 E. Milwaukee Ave., Detroit 2, Mich.* Service is for chromium plating small parts such as screws and rivets. These parts are processed in bulk without racking throughout the plating cycle, eliminating the handling of pieces individually.

TUBULAR SECTIONS—*The Federal Machine and Welder Co., Warren, Ohio.* Westin process is for the forming of tubular sections by a combination of electric current and pressure. A heating transformer, dies, and mechanism for holding and rotating the tube, are utilized.

MOLDING PROCESS—*Product Technicians, Inc., 65 Broad St., Rochester 4, N. Y.* Prodel Process utilizes a soft rubber-like material for the original mold from which castings of Bakelite resins can be made. Process was developed from making sample molds and designed to provide intricate shapes without expensive tooling. Tolerances of ±0.005 in. can be held.



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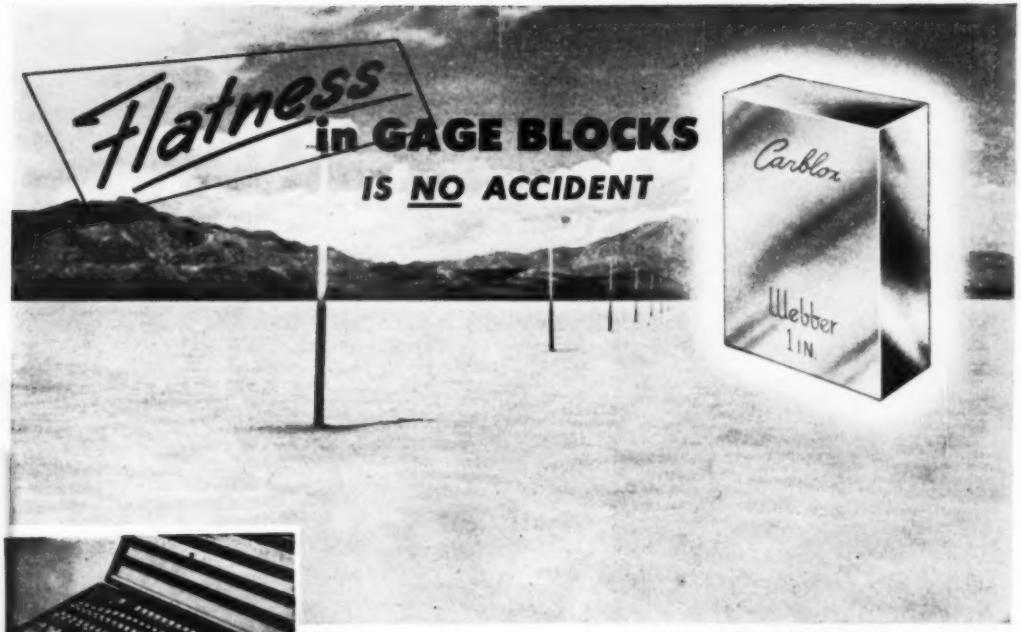

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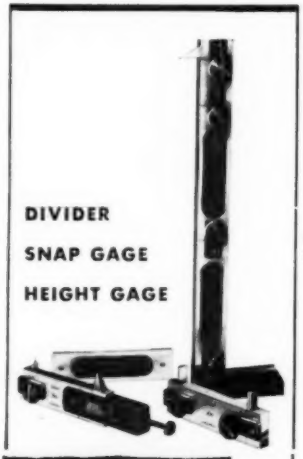
12901 Triskett Rd. Cleveland 11, Ohio



Carblox Wear Gages add the wearing qualities of carbide to any standard steel gage block set. Set of 2 with case, Two Sizes
.100 $21.50
.050 27.50

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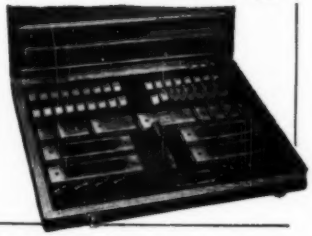

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American Machinist

REFERENCE BOOK SHEET

Computing Steps of Straight Form Tools

BY S. H. BALDERSON, DAVIS & HEMPHILL COMPANY

MANY METHODS have been used to compute the steps on straight form tools made to cut two or more diameters. The following method is simple, accurate and does not involve approximations.

In jobbing shops, especially short-run jobbing shops, straight forming tools are often favored because of their low cost and yet a hit-or-miss method of grinding steps is used. The following figures are merely an explanation of how the method works and if they seem complex to the shop man, it should be remembered that the actual figuring for a tool is simple.

The two factors influencing step diameters are: (1) the clearance angle of the tool, and (2) the rake angle. Where a fixture is used to grind all tools with the same clearance angle, this factor is reduced to a constant and the only variable is the rake; and for brass-cutting tools where no rake is used, the only factor is the clearance angle, which may be a constant.

The method is as follows: *To find the amount of step to be put on a tool, multiply the step to be cut by the cosine of the total of the rake and clearance angles.* This can be further simplified by a short table for use in the shop, as will be explained later.

The following is an explanation of how the method was arrived at; and close examination will show that there has been no approximation or assumption of dimensions or angles.

VALUES OF COS ($\angle 2 + \angle 4$) where $\angle 4 = 7°$

RAKE ANGLE	CLEARANCE ANGLE	TOTAL	COSINE Multiply Desired Step By This Value
0°	7°	7°	0.99255
2°	7°	9°	0.98769
4°	7°	11°	0.98163
6°	7°	13°	0.97437
8°	7°	15°	0.96593
10°	7°	17°	0.95630
12°	7°	19°	0.94552
14°	7°	21°	0.93358
16°	7°	23°	0.92050
18°	7°	25°	0.90631
20°	7°	27°	0.89101

In the diagram, Fig. 1:
AC is perpendicular to BC
EB is perpendicular to BD
AB is the step to be cut
$\angle 2$ is the rake angle
$\angle 4$ is the clearance angle
AF is parallel to BG
To find AC, the step to the tool:
$\angle 5 = 90°$
$\angle 3 = 90° - \angle 1$
$\angle 3 = 90° - (\angle 2 + \angle 4)$
$\therefore \angle 1 = \angle 2 + \angle 4$
$\text{Cos } \angle 1 = AC/AB$
$\text{Cos } (\angle 2 + \angle 4) = AC/AB$
Then $AC = AB \times \text{Cos } (\angle 2 + \angle 4)$

If the clearance angle 4 is always the same, a simple table can be made up for different rake angles. The accompanying table is written for a standard clearance angle of 7° and rake angles of 0° to 20°. To find the amount of step to put on the tool, select the desired rake angle and multiply the figure in the last column by the amount of step desired on the finished part. For other clearance and rake angles, the cosine may be taken from any table of trigonometric functions.

Example: suppose a straight form tool is to be made for the part illustrated in Fig. 2.

On the part to be made

$$\text{Step } A = \frac{0.972 - 0.748}{2} = 0.112 \text{ in.}$$

$$\text{Step } B = \frac{0.748 - 0.372}{2} = 0.188 \text{ in.}$$

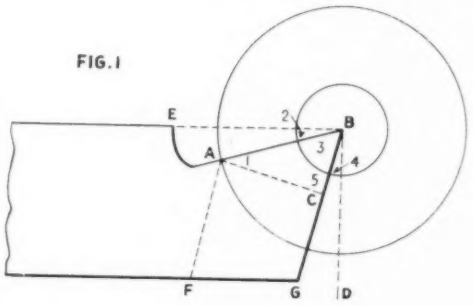
For a 10° rake angle, and using the table, the tool should be made with:

$$\text{Step } A = 0.112 \times 0.9563 = 0.1071 \text{ in.}$$

$$\text{Step } B = 0.188 \times 0.9563 = 0.1798 \text{ in.}$$

This article was prepared under the auspices of the Manufacturing Standards Committee of the National Screw Machine Products Association.

FIG. 1



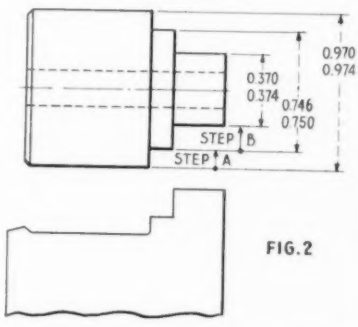
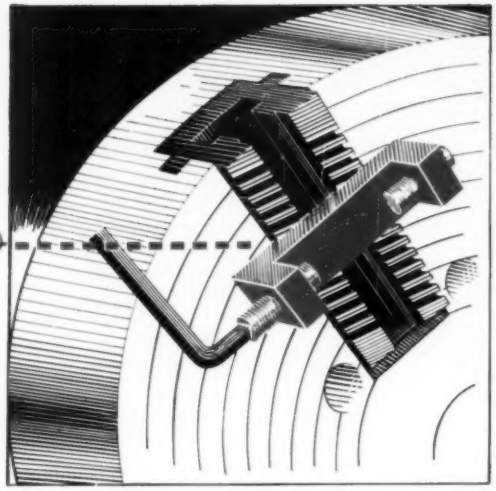


FIG. 2

Safety margins... *plus*

for *heavy*
Carbide Tool
Cutting



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Cushman Power Chucks meet this need . . . with a plus margin of safety . . . in precision centering, positive controlled grip, greater output, minimum rejects. They relieve the operator of the burden of manual operation in repetitive production . . . a twist of the wrist or a touch of the toe . . . and jaws grip or release work instantly. Cushman's exclusive "Accralock" feature permits fast, individual jaw adjustment to within .001" concentricity and maintains that accuracy indefinitely. A Cushman installation, easily made on present equipment, is a definite attack against present fixed high costs . . . gives you a competitive advantage in production.

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Planing With Carbides...I

COURTESY CINCINNATI PLANER COMPANY

SELECTION GUIDE FOR CARBIDE GRADES

Material	Operation	Carboloy	Firthite	Kennametal	Vascoloy Ramet	Allegheny Ludlum
Steel	Rough Forgings and Bar Stock	78-B	T-04 T-A	KM	EE	CA5
	Rough—Sandy Castings	78-B	T-04 T-A	K2S	EE	CA5
	Semi-Finishing	78	T-16	KH or K3H	EM	CA1
	Finish Over .005" Feed	78	T-16	K3H	EM E	CA2
	Finish Under .005" Feed	831	T-31	K4H	E	CA2
Stainless Steel	Roughing and Finishing	78-B	T-04	K3H	EM	CA5
Cast Iron	Roughing— Finishing—	883	HE	KI K4H	2A5	CA5I CA7
Semi-Steel C.I	Roughing— Finishing—	883	HE	KI K4H	AT or 2A5	CA5I CA7
Aluminum Magnesium	Roughing— Finishing—	44A 883	HA HF	K4H K4H	2A5 2A7 or 2A9	CA4 CA8
Brass Bronze	Roughing— Finishing—	44A 883	HA HE	K4H K4H	2A68or2A5 2A5 or 2A7	CA4 CA8

Several companies produce good carbide tools for roughing and finishing operations on various types of materials. The chart above for carbide grade selection is not intended to recommend any particular make of carbide but only to show the various types of carbides that can be selected.

Planer Requirements

A planing speed of 100 sfpm. is the minimum to warrant the extra cost of carbide tooling. Machine must be in good condition: feed uniform from stroke to stroke; tool lifters provided; head gibs fitted properly, saddles with uniform sliding fit along rail; tool blocks snugly fitted in clapper boxes; binder screws in good condition.

Carbide Grade Selection

Hard grades should be used for finishing; the tougher and softer grades for roughing. Cratering is more pronounced with increase in carbide hardness and cutting speed. A soft grade will not crater when planing semi-steel cast iron at 150 sfpm., but does groove at 200 sfpm., and tool life is halved.

Speeds and Feeds

Depth of cut is the most important factor in planing cast iron and ordinary steels; hardness of material is secondary. The cutting speed depends on depth of cut, nature of material, machine condition, power available and other factors. The advantages of using carbides are usually obtained by increasing the cutting speed, not the feed. A deep cut with a light feed is better than a light cut and heavy feed, because the chip pressure is better distributed over a long cutting edge. And as the depth of cut is increased, the work speed should be decreased slightly to avoid heat cracking of the carbide.

Horsepower Requirements

Horsepower consumed is directly proportional to the cutting speed. It is important to know how large a cut can be taken with the power available, or how much power is required approximately for a specific operation. The accompanying table can be used under ordinary conditions, but other factors not to be overlooked are: tool design, tool grinding, tool sharpness and the

PLANING SPEEDS FOR VARIOUS MATERIALS, Sfpm.

	Roughing				Finishing
Depth of Cut, In.	.500 to 1.000	.250 to .500	.125 to .250	.015 to .125	.003 to .015
Feed Per Stroke, In.	.010 to 1.00	.015 to .125	.015 to .175	.015 to .200	.015 to 1.000
CI Hard and Meehanite	150	175	185	200	200
CI Soft	175	200	225	250	250
Semi-Steel C.I.	150	175	200	210	210
Steel Carbon			250	300	300
Free-Cutting Steel	225	250	300	300	300
Stainless Steel				250	300
Cast Steel	150	180	200	250	250
Brass—Hard	150	200	225	250	300
Brass—Soft	250	275	300	350	400
Aluminum	300	350	400	450	500
Plastics	.	. . .	450	600	750

For interrupted cuts on steel, reduce speed 25%. No Coolant.

FACTORS FOR CALCULATING HORSEPOWER TO PLANE CAST IRON AND STEEL

Depth of Cut, In.	Amount of Feed Per Stroke, In.					
	1/32	1/16	3/32	1/8	5/32	3/16
1/64	.0115	.0235	.036	.047	.059	.071
3/64	.0172	.0352	.054	.070	.088	.106
1/16	.023	.047	.073	.094	.118	.142
3/64	.029	.058	.091	.117	.147	.177
1/32	.035	.070	.110	.141	.177	.213
7/64	.041	.082	.128	.165	.206	.248
1/32	.047	.094	.147	.189	.236	.284
9/64	.055	.106	.165	.212	.265	.319
5/64	.063	.118	.184	.236	.295	.355
11/64	.071	.130	.202	.260	.325	.390
3/32	.080	.142	.221	.284	.355	.426
13/64	.083	.153	.239	.307	.384	.461
7/64	.087	.165	.257	.331	.414	.497
15/64	.090	.177	.275	.354	.443	.532
1/8	.094	.189	.294	.378	.473	.568
17/64	.100	.200	.312	.401	.502	.605
9/64	.106	.212	.331	.425	.532	.639
19/64	.112	.224	.349	.449	.562	.674
5/32	.118	.236	.368	.473	.592	.710
21/64	.125	.250	.391	.502	.628	.745
11/64	.133	.265	.414	.532	.665	.781
23/64	.140	.280	.437	.561	.702	.816
3/16	.148	.295	.460	.591	.739	.852

For a given cut find the factor for desired depth of cut and feed. Multiply this value by the cutting speed in sfpm. The result will be the horsepower required to plane cast iron with one head. If steel up to 40 points carbon is to be machined, multiply the above result by 2; if steel is above 40 points carbon, multiply by 2 1/4

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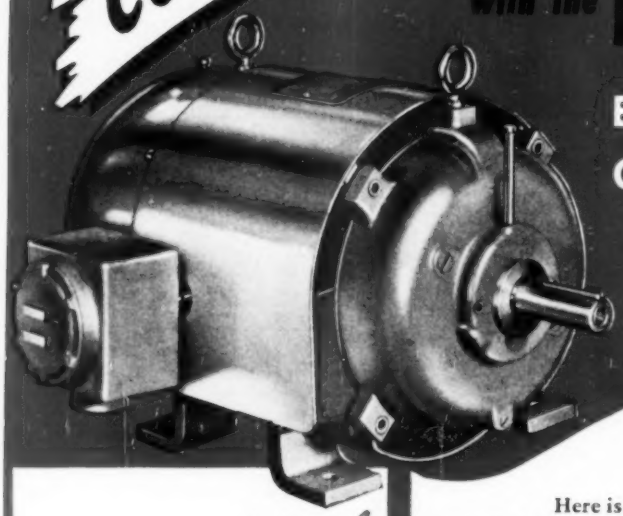

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Planing With Carbides...II

exact nature, or machinability, of the material.

Cutting-Tool Design

Planer tools may have a tip clamped or brazed on top of the tool shank (0.55-0.90 carbon steel heat-treated to 45-50 Rockwell C) but not brazed in a milled pocket, to avoid cracking of the tip. The brazed-tipped tool can be used for all finishing operations and for light roughing cuts. But for deep cuts or large area cuts, the clamped-on tool is often preferred.

A tool ground in a certain way will perform well on the first lot of castings and be found unsuitable for the next lot. Safe rules, see Fig. 1, are

1. For roughing tools, the included cutting edge angle *A* should increase with material hardness. In fact, on many carbide planing tools, *A* has been increased to the point where the primary side rake angle *B* is zero for cast iron and up to 20° negative for steel.

2. As mentioned, the primary side rake angle *B*, shown on land *K*, should be decreased to increase *A*. Width of land *K* should be slightly greater than the feed per stroke.

3. Secondary side rake angle *B'* should be sufficient to allow proper chip flow.

4. Side relief angle *C* is always held to a minimum to provide maximum support to the cutting edge without rubbing.

5. End relief angle *D* is always held to a minimum for the same reasons as at *C*. A 4° end-relief angle is used on the tip of the tool shown in Fig. 2 and a 6° angle on the shank so that the diamond wheel will clear it when grinding the tip.

6. The end cutting edge angle *E* is generally held between 8° and 12° to facilitate setting the tool to the work.

7. Back rake angle *F*, as used on the majority of roughing tools for cast iron and steel, varies between zero and 20° negative. Thus, in entering the work, initial contact is above point *X*, the weakest part of the tool. For finishing tools, a 10° to 15° positive back rake makes possible running at faster speed and in many instances eliminates fine tool chatter.

8. A large side cutting edge angle, or lead angle, *G* of 30° to 40° should be used, together with as large a nose radius *H* as possible, particularly on roughing tools. A large lead angle thins the chip and relieves shock at the weak point *X* by causing initial contact above that point. But nose radius *H* must not be so large that chip flow is impeded. A nose radius of ⅛ in. has been found satisfactory on tools for roughing both cast iron and steel.

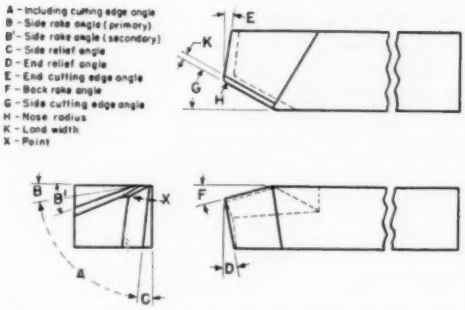

FIG. 1 . . Textual references to preferred tool angles for roughing and finishing cuts utilize the nomenclature given

ROUGHING TOOLS

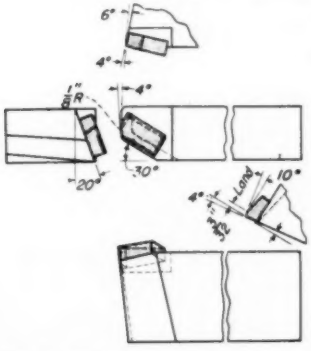

FIG. 2 . . Tipped tool for horizontal surfaces in steel

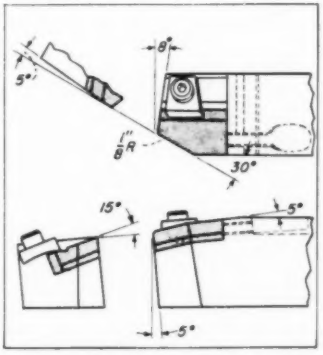

FIG. 3 . . Clamped-on tool for horizontal surfaces in cast iron

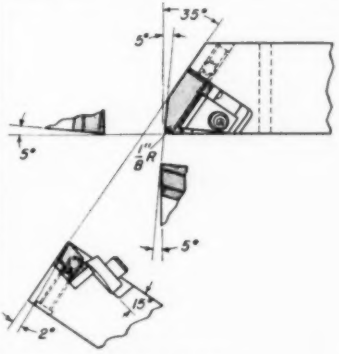

FIG. 4 . . Clamped-on tool for vertical surfaces in cast iron

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New Units Feature Materials Handling Show

PHILADELPHIA—Emphasizing the increasing importance of materials handling to American industry, the third National Materials Handling Exposition Jan. 10-14 at Convention Hall featured a wide variety of exhibits by over 225 manufacturers. Visitors at the show saw the latest models of overhead and floor equipment, both mechanized and manual; containers and carriers; and all accessory equipment related to the task of material movement.

Interest ran high on industrial power trucks, with several new models on display. Shown in public for the first time was a truck with the new Dynatork drive developed by the Clark Equipment Co., Battle Creek, Mich. Power from the truck's engine is transmitted by a magnetic induction drive that eliminates the clutch, permits instantaneous reversal of travel direction, and is claimed to make wheel slippage impossible, increase working speed and maneuverability, and prevent stalling.

Chrysler Engine Used

Another first in exhibits was the gasoline-powered tilting fork truck of the Yale and Towne Mfg. Co., Philadelphia. The new line is powered with Chrysler engines and has a fluid drive which simplifies operation by eliminating constant gear shifting. On this as well as on the electric powered trucks in the Lift-King line the telescopic lift does not increase the base over-all height until a primary lift of 66 in. has been exceeded, after which a lift up to 130 in. may be made.

Meeting a demand from the field for lighter weight equipment for operation in multi-story buildings, several companies exhibited small size power fork trucks in capacities ranging from one-half to one and one-half tons. These machines offer a solution to problems of limited floor load and elevator capacity and likewise are in the lower price bracket.

Featherweight Fork Truck

In this group was a featherweight fork truck introduced by Automatic Transportation Co., Chicago. A 1,000-pounder designed for a 30 in. load weighs 2,360 lbs. and 2,623 lbs. when rated for a 47 in. load. A 1,500 lb. unit is also available, with a collapsed height of 78 in., both models lift to 134 in. with a "free" lift of 68 in. before the telescopic mechanism is extended. High maneuverability is claimed and the new units are said to have many of the design features of the larger models.

Designed to fill similar needs, a 1,000 pound fork lift truck shown by Baker-Raulang Co., Cleveland, has a total gross weight of 3,800 lbs. including load truck and batteries. It was pointed out that the small trucks may also have application for another reason in addition to the weight, space, and cost considerations. These factors often can be met with power-driven hand trucks, but in some cases operators object to walking with the load. For such a problem the small truck may be the answer, it was said.

Along the same lines, Automatic Transportation Co. came out with a battery-operated stacker on which the operator rides. The machine is designed as a low-cost, light-weight unit to bridge the gap between fork and motorized hand trucks.

Versatility Stressed

Emphasis on versatility was evidenced by the considerable number of attachments to adapt fork lift trucks to specific duties. An interesting unit exhibited by Hyster Co., Portland, Ore., combined a squeezing action in the horizontal plane with a rotating motion through an arc of 186° in addition to motion in the vertical plane. Such an attachment can be applied to dumping scrap bins and with properly contoured arms to dumping barrels.

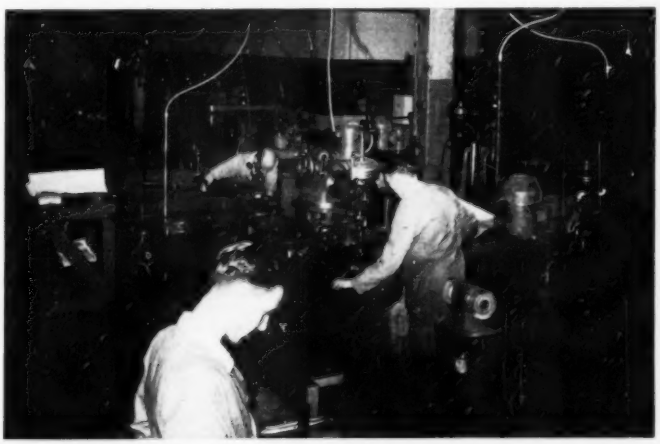
Other units exhibited by numerous truck manufacturers included accessories to eliminate the need of pallets on package goods, carriages that rotate through 360°, pushers, side shifters, scoops, upenders, and cranes.

A new live-roller conveyor with chain drive was shown by Standard Conveyor, N. St. Paul, developed to prevent injury to hands. Power is transmitted to the roller by means of a friction bearing and any individual roller can be stopped by light hand pressure. At present the unit is intended for weights up to 150 lbs.

Portable Belt Conveyor

Also attracting attention at the same booth was a portable belt conveyor that by means of a panto-

(Continued on page 270)



***PRECISION GAGES** are built at Sydney, Australia, at the Sheffield Corp. of Australia Pty. Ltd. plant set up by the Sheffield Corp., Dayton, Ohio. The American firm holds 49% of the company's interest, with the Australian firm of Westcott Hazell Ltd. as a partner*

(Continued from page 269)
graph linkage can be extended to as much as 46 ft. To permit the extension the belt operates without tension rollers and feeds from a magazine. Used primarily on loading docks, the unit can be adjusted to deliver into trucks at the point where material is needed.

Another conveyor item, shown by Speedways Conveyors, Buffalo, was a section to apply two strips of glue to the bottom of containers. Thus, as cartons come off the conveyor they are already prepared for gluing into solid loads for shipping without strapping.

Demonstrating the automatic operation that may be built into conveying systems was an exhibit by Alvey Conveyor Co., St. Louis, containing automatic control units and chain-driven, right-angle transfer devices.

High-Duty Trolley Shown

Designed for fast-frequency, heavy service, a new high-duty trolley was shown for the first time by American Monorail Co., Cleveland. A floating-yolk saddle gives the trolley extreme flexibility such that cutting and wear rail is reduced.

Lower priced items also made their appearance in the hoist field. One such item is a new wire rope hoist introduced by Robbins & Myers, Inc., Springfield, Ohio. Also shown by the same company was a hoist with trolley powered by means of a fluid coupling between the motor and trolley drive, thus giving smooth acceleration from standstill.

Said to be the first practical, moderately priced unit of its kind, General Electric Co. exhibited a self-contained all-electric speed control AC motor particularly applicable to conveyor drives. A brush-shifting mechanism provides infinitely variable speed up to a 20 to 1 ratio. Built as high as 300 hp., the motor is standard from 3 through 75 hp., and can be obtained as a gear motor.

Sequence Changer Exhibited

Also shown by General Electric, for copper-oxide rectifier equipment was a sequence changer that makes it possible to put two industrial truck batteries on the line simultaneously. One is charged at the high rate until 80% charged; then the unit automatically switches to the second for the same period. Next the unit automatically changes to the low rate for three hours and brings both batteries to full charge simultaneously.

A unique semi-automatic strapping machine that also has production possibilities was demonstrated by Signode Steel Strapping Co., Chicago. With the item in position on the machine table, the operator depresses a petal to start the cycle. Wire, feeding from a reel, encircles the item, and the machine affixes the seal, tensions crimps and cuts the strap to complete the operation.

Among the items exhibited by Westinghouse Electric Corp. was an industrial truck control that protects the motor from shock when the truck is reversed by applying dynamic braking to slow the truck to the speed at which power reversal causes no harmful effect on the motor.

Eliminating the problem of difference in type of truck and dock was a hydraulic loading dock ramp described by the Wayne Pump Co., Fort Wayne, Ind. Hinged to the dock at one end, the other end may be depressed or elevated to the exact height for the truck body. A difference of height of as much as 20 inches plus allowance for spring depression may be overcome.

Conference Held

Held concurrently with the show was the Materials Handling Conference, arranged by the materials handling and management division of the American Society of Mechanical Engineers. Attracting a large audience was a session on improvements in methods, chaired by H. B. Maynard, Methods Engineering Council. Speaking to this group, Allen H. Mogensen, consultant, stated that determining "why" materials have to be moved is the principal challenge and warned that often too much time is devoted to "how" to move material rather than "why". Mogensen put the next problem as one of human relationships and stressed the need of getting men on the job to think and contribute to simplification.

Co-sponsor of the exhibit is the Materials Handling Institute, Pittsburgh.

Labor Leaders Defended

PHILADELPHIA — Progressive labor union executives welcome the installation of labor-saving devices because they result in greater earnings for employees of companies using them, Samuel W. Gibb, Yale and Towne Mfg. Co., asserted at the Materials Handling exposition Jan. 10-14.

Mr. Gibb's defense of union leaders was contrary to the statements made by some industrial leaders who claimed labor leaders had sought to enforce "feather-bedding" policies with respect to labor-saving devices.

Air Force, Navy Change on Types Of Planes Affects 9 Major Concerns

WASHINGTON — Air Force and Navy continue to change their minds on what kind of planes they want. Latest re-shuffle of fiscal 1949 aircraft procurement funds involves nine major manufacturers and 666 planes. It is caused by rapidly changing technical developments and military requirements.

The following companies took cancellations:

Chance-Vought Division, United Aircraft Corp., $15 million for 30 Pirates (F6U) Navy jet fighters.

Glenn L. Martin Co., $9 million for 47 Maulers (AM-1) Navy Piston engine attack planes.

Republic Aviation Corp., $30 million for 100 Thunderjets (F-84) Air Force jet fighters.

New orders went to:

Boeing Airplane Co., $39 million for 23 additional C-97 Strato-freighter cargo transports.

Consolidated-Vultee, $20 million for 37 twin-engine military trainer versions of its commercial airliner. Total of 36 T-29s will be navigator trainers and one T-32 the prototype for a new bombardier trainer.

Chance-Vought, $15 million for an additional 125 Corsair (F4U-5) Navy piston engine fighters.

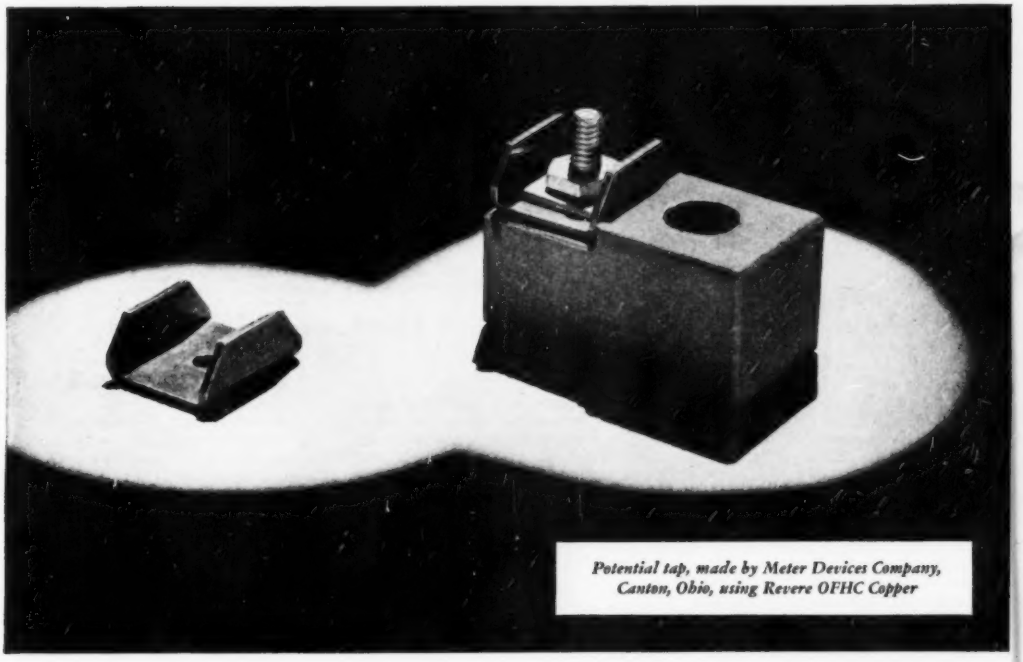
Fairchild Engine & Airplane Co., $45 million for 110 F-94 two-seater USAF jet night fighters; 16 two-seater TF-80 jet trainers for the Navy and two specially-equipped Constellation transports for Navy Radar picket planes.

North American Aviation, Inc., $30 million for 28 Navy AJ-1 carrier attack planes each powered by two piston engines and one jet engine.

Northrup Aviation, Inc., $50 million for 48 F-89 twin-jet two-seater USAF night fighters. The F-89 is the heaviest fighter ever built weighing more than a fully loaded DC-3 transport.

These allocations exhausted U.S. Air Force fiscal 1949 procurement funds. To get the additional 23 Boeing Stratofreighters required to replace transports lost in the Berlin Airlift, the Air Force had to dip into other parts of its budget and hope it can recover the money in a supplemental appropriation request to Congress. USAF will ask $110 million to cover the unanticipated cost of the Berlin Airlift. Navy still has $84 million in fiscal 1949 plane funds awaiting presidential certification. This money will be spent for increases in previous orders for the Chance-Vought Cutlass (F7U) and Grumman Panther (F9F), both jet fighters; the Douglas Skyraider (AD) piston engine attack plane; and Lockheed Neptune (P2V) long-range patrol bomber.

IT PAYS TO LOOK AT COST PER PART NOT PRICE PER POUND!



Potential tap, made by Meter Devices Company, Canton, Ohio, using Revere OFHC Copper

THERE'S certainly nothing complicated-looking about the small stamped channel section of .042" gauge copper shown in the accompanying illustration. And that's what makes this story all the more interesting.

It is told by Mr. T. J. Newman, Manager of the Meter Devices Company, Canton, Ohio.

"Even a relatively simple application can cause trouble," says Mr. Newman, "a lot of trouble—if you are not using exactly the right metal for the particular job.

"In our case the problem centered around this small stamped channel, originally made of electrolytic copper with a Rockwell B 35/45. The part is bolted to a porcelain base and mounted on the test panel in a standard electric meter box. Used on the service box for test purposes, it allows the connection of a small feed-in wire off the main lines to supply the potential coils in the meter.

"Sounds simple enough. Yet complicated trouble came quickly. It started with cracks in the bends. And that resulted in a high percentage of rejections, along with expensively close inspection.

"It was then that we called in the Revere Technical Advisory Service. Acting on their recommendation, we exactingly tested potential taps made of OFHC Copper with Rockwell B 49/50. Results were so satisfactory that we placed a considerable production order.

"In doing so we frankly paid a premium for OFHC. But that premium is much more than offset by our saving in scrap and the all-around reduction in costs. Our potential taps now have no more cracks in the bends—there are no rejections whatever—and expensive inspection has been eliminated."

Thus the Meter Devices Company has learned, by its own exacting tests, that the premium purchase of OFHC Copper is a real economy. Once again it is proved that the real guide to economy is the cost of the finished part, not the price per pound of the metal of which it is made.

This progressive company is only one of the many modern industrial organizations that have profited by calling in the Revere Technical Advisory Service. Perhaps you would profit too. We suggest that you ask the nearest Revere Sales Office for more information.

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***NEW YALE AND TOWNE** plant at Philadelphia provides 775,000 sq. ft. of floor area for the manufacture of Yale materials handling machinery. Entire plant was laid out and designed around the materials handling system to insure top production efficiency and convenience of workers*

New Yale and Towne Plant Features Efficiency

PHILADELPHIA—Three years of planning to provide the most modern facilities for the manufacture of Yale and Towne materials handling machinery were climaxed with the recent opening of a new plant at the company's Philadelphia division. Scientifically planned for top production efficiency, the new building was constructed around a layout designed to provide ideal conditions for an effective materials handling system.

From the over-all view, department locations and machine arrangements are planned for the smooth movement of material throughout the plant. High ceilings and large unobstructed areas permit the use of overhead equipment and cranes, hoists, and monorails are used extensively. Broad aisles and ample space around machines and work areas enables quick operation of floor equipment, including platform, fork trucks, and power hand trucks. Containers best suited to the handling task are employed, and both methods and equipment are integrated into one over-all system. (Details concerning the layout and handling phases of the new plant were described in American Machinist, December 30, pages 93-96.)

Contented Personnel Goal

Yale and Towne believes, however, that a contented personnel producing under good working conditions is likewise an essential element in high operating efficiency. Thus, the same care and attention given to the manufacturing facilities was applied in planning for the welfare and safety of the employees both in the factory and office throughout the entire plant.

Work areas are illuminated to a near daylight intensity with both fluorescent and mercury vapor lamps to supplement the daylighting that enters through 36,300 sq. ft. of window space. A ventilating system changes the air periodically and the temperature may be thermostatically controlled.

Ample washroom facilities are provided and each employee is assigned individual full size steel wardrobes in vermin proof locker rooms on mezzanine floors.

Plant Has Hospital

A plant hospital, with a staff including registered nurses, under the supervision of a medical director, has walls of sea green tile and includes a general treatment room, eye corner, laboratory, wards and a well-equipped therapy room.

A plant cafeteria will be opened on Feb. 1 and food will likewise be transported to heavily populated shop areas in mobile canteens equipped for serving both hot and cold foods. The parking area adjoining the plant will accommodate 800 cars.

Speaking of the opening of the new plant, Calvert Carey, president of the Company, said the increase in the cost of doing business has become one of the nation's most serious challenges, but that there is a growing realization of the very substantial benefits to be gained from handling goods mechanically rather than manually. The new plant will provide the Philadelphia division with greatly expanded facilities to serve industry's requirements for cost saving mechanized handling equipment, he said.

Union Leaders Oppose Decisions

WASHINGTON—Union leaders will press Congress to nullify the effect of two recent Supreme Court decisions when it passes a substitute for the Taft-Hartley Labor Law.

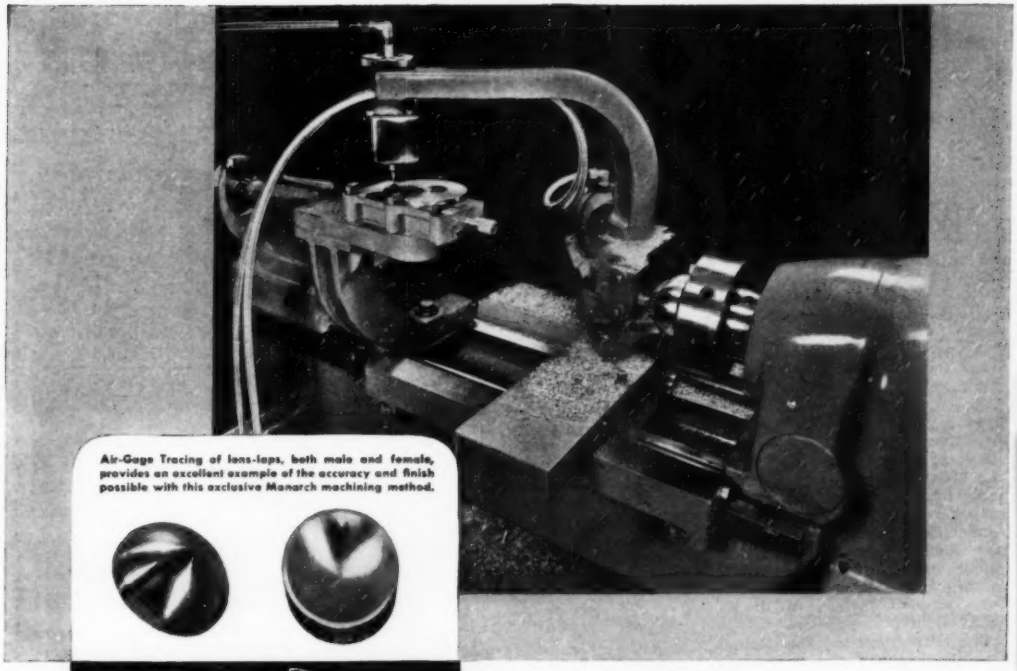
In the two decisions the highest court:

1. Upheld the legality of closed shop bans in Arizona, Nebraska, and North Carolina, which in effect approved similar bans in nine other states and procedural restrictions in three others.

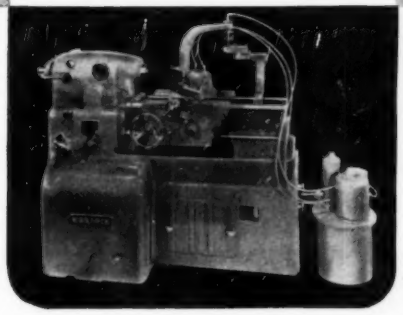
2. Declared constitutional the provision of the Taft-Hartley law which denies collective bargaining protection to foremen.

The Taft-Hartley law prohibits closed shop contracts in any industry affecting interstate commerce. It also gives precedence to the more stringent anti-closed shop laws in 12 states which prohibit any form of union contract clause which makes union membership a basis for employment.

Labor's attack on closed shop bans will be in two directions. One, to seek repeal of the bans in Arizona, Arkansas, Florida, Georgia, Iowa, Nebraska, North Carolina, North Dakota, South Dakota, Tennessee, Texas and Virginia. The other, to eliminate the closed shop ban in the prospective new federal labor law and to make state laws subservient to federal law in industries affecting commerce. Four states—Kansas, Wisconsin, Colorado and New Hampshire—permit the closed shop if it is authorized by a vote of the employees affected.



Air-Gage Tracing of lens-laps, both male and female, provides an excellent example of the accuracy and finish possible with this exclusive Monarch machining method.



NOW!

All the Advantages of AIR-GAGE TRACING Available for SMALL, HIGH-SPEED WORK

● Here's a new Monarch high-speed contour turning team to *push your costs way down.*

The proved advantages of Air-Gage Tracing now are available on the famous Monarch high-speed 10″ EE Precision Manufacturing Lathe.

By the exclusive Air-Gage Tracing method you can turn step shafts; turn, bore and face contours of innumerable kinds. This is done in a fraction of the usual machining time, at a fraction of normal costs—*and with better accuracy and finish.*

Air-Gage Tracing provides an automatic machining cycle and automatic sizing. All cutting is done with a single-point tool and over a wide, stepless range of cutting speeds. Accuracy is assured by the air-gage-like action of the tracer mechanism. Finish is improved; setup time and tooling costs greatly reduced by the single-point cutting method.

If you want peak production at a profit, then you'll want Air-Gage Tracing for your small-parts machining operations. Let us supply you with complete details.

ACCURACY · ECONOMY · LONG LIFE

Monarch TURNING MACHINES

THE MONARCH MACHINE TOOL CO., Sidney, Ohio

FOR A GOOD TURN *FASTER*—TURN TO MONARCH

Detroit

CHRYSLER SHOWS 1949 MODELS IN FOUR LINES . . . PONTIAC, CHEVROLET, STUDEBAKER, KAISER-FRAZER REVEAL CARS

New 1949 automobiles have now been shown or announced by most manufacturers. January saw formal announcements by Chevrolet, Pontiac, and Studebaker, and informal showings of the new offerings of Chrysler and Kaiser-Frazer.

The preview by Chrysler Corp. attracted some 500 press representatives who looked over the cars about 6 weeks in advance of public announcements. They saw new body shells on all four corporation divisions—Plymouth, Dodge, DeSoto, and Chrysler—along with less major mechanical changes.

Appearance-wise all the Chrysler cars are closer to their 1948 counterparts than has been the tendency among other post war producers. Fenders have been retained as separate units. However, these are flowed into widened and more graceful bodies. The bustle back has been adopted instead of the fast backs of the previous jobs.

The attractions of the Chrysler Corp. line were headed by two brand new models, a Dodge roadster on 115 in. wheel base, and a Plymouth suburban on 111 in. wheel base.

Old-Time Tradition

The Dodge roadster is in the old-time tradition, with hand mounted top, but with plexiglas side panels which are detachable and storeable behind the seat. This model will probably be the base price job of the line.

The Plymouth suburban is a new type of automobile, similar to the Kaiser vagabond unveiled a few days earlier. Both these jobs feature a fold down rear seat whose back becomes the floor. The rear end of the car opens out with a tailgate and upper panel, providing access from the rear.

All the Chrysler Corp. units are on longer wheel bases, the objective being an improved ride. The standard Plymouth models now are on 118½ in. wheel base, up 1½ in. from last year. Engine mounting position has not been changed; more inside room is provided.

Compression ratios are now 7 to 1 on all 6 cylinder engines and 7.25 to 1 on the 8 cylinder Chrysler power plant. This increase in compression ratio results in modestly improved horsepower and considerably improved torque, with better performance.

Kaiser-Frazer showed not only its vagabond, but 3 other new models as well. The vagabond differs from the Plymouth suburban in that it is built around a standard 4-door Kaiser body, except that it can be split in the rear and the rear seat folded away.

***PLENTY OF BODY ROOM**—By moving well forward, its improved valve-in-head six, Chevrolet mounts a lower and wider Fisher body so that the rear seat is now 18 in. ahead of rear axle, but over-all length remains approximately the same and wheelbase is shortened only one inch. Seating accommodations provide more room for legs, heads and shoulders than common. New weight distribution plus new airplane shock absorbers and springing improve riding qualities. Shown: Styleline sedan with "notched back"—also available: Fleetline with "fast back," a new all-steel station wagon, convertible and coupes*

Nylon-Covered Metal

Kaiser also showed its dealers, gathered in mid-January at Detroit, a hard-top convertible with nylon stretched over the metal sheet to simulate a convertible, an actual orthodox convertible, and a new taxicab.

Studebaker's offerings for 1949 distinguished from the predecessors only by a vastly more luxurious trim. Imitation alligator leather is used in abundance.

Emphasis this year is on color and fabric combinations and unusual trim materials. Typical of the many available combinations is this one: medium grey cushions, grey and green striped seat backs blending with aqua side and head trim. Steering wheels, instrument panels, and window reveals also change colors to match fabrics used in the interior.

Vertical instead of horizontal mounting of the spare tire has increased storage space in trunks of all models.

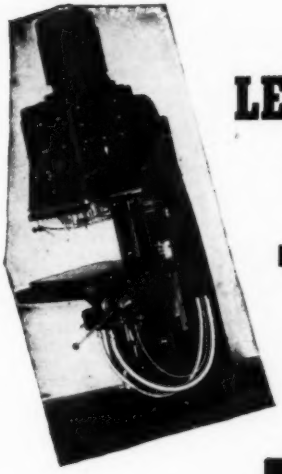
Chevrolet Tops Million

NEW YORK—Chevrolet plans a 10% increase in production for 1949. With 775,000 passenger cars and 389,000 trucks in 1948, this GM division continued its dominance of automotive sales, and exceeded a million units for the fourth time since 1936.

In the 1946-48 period Chevrolet out-produced its nearest competitor by 665,000 Units, and for the first time more Chevrolet trucks are registered in the United States than any other make.

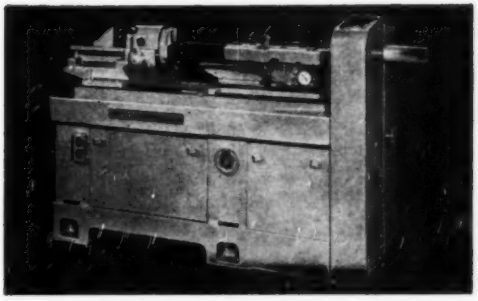
Dealers' orders, up 100,000 units over a year ago, are approximately equal to 1¾ years' production. Confidence is expressed that the order bank will not melt in 1949.

With only a slight price increase, plus continuance of lowest prices in the low-priced market, it is probable that there will not soon be much improvement in the current delivery situation of 12-14 months.



THE LELAND GIFFORD LINE

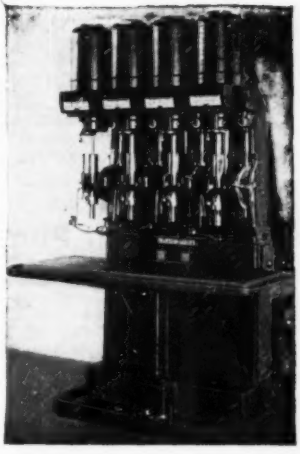
includes a drilling machine
to meet your every need.
Individually motored spindles
Speeds instantly selected
Wide speed ranges



NO. 1 SUPER HIGH SPEED
NO. 2 TO CAPACITY OF NO. 2 M.T.
NO. 3 TO CAPACITY OF NO. 3 M.T.
NO. 4 FOR HEAVY DUTY

. . .

VERTICAL AND HORIZONTAL
DEEP HOLE DRILLING MACHINES
16 SPINDLE ADJUSTABLE



LELAND-GIFFORD

WORCESTER 1, MASSACHUSETTS, U. S. A.

Stand-by Executive Staff

Provisional Metalworking Machinery Section

(To be activated, in emergency, under War Production Board.)

Chief, H. T. Tigges, Baker Brothers.

Temporary 1st Assistant Chief, Don Laflin, Giddings and Lewis Machine Tool Co.

A. Statistics, Order Boards, Report Forms: Garth Courtois, Kearney and Trecker Corp.; assisted by J. F. Owens, Jr., J. F. Owens Machine Co.

B. Pool Orders: C. E. Needy, Landis Tool Co.; factory contacts—New England, New York, Pennsylvania, New Jersey.

John Bradner, Lees-Bradner Co.; factory contacts—Ohio, Michigan, Kansas, Indiana.

Don Laflin; factory contacts—Illinois, Wisconsin, and west of Chicago. Note: Mr. Needy to be in charge first year, assisted by Mr. Bradner.

C. Diversions and Filter Forms: A. B. Kettle, Austin & Hastings Co.; George Day, formerly Marshall and Huschart Machinery Co.

D. Controls and Priorities: E. C. Adams, Van Norman Company.

E. Adviser to the Chief on Export: Noble Clark, Warner and Swasey Co.

F. Compliance, Field Inspections: Frank Armstrong, Marshall and Huschart Machinery Company; George Sanborn, Fellows Gear Shaper Co.

G. Idle Tools, including used: Victor Gottsman, Victor Gottsman Machine Co.

H. Technical Advisers: tentatively A. C. Danekind, Maytag Corp.; Walter Wagner, Ford-Lincoln Division of Ford Motor Co.; C. Collings, Hughes Tool Co. (for Southwest Region)

J. Special Machines, including special attachments and fixtures: K. L. Finkenstadt, W. F. & John Barnes Co.; W. Faud, John Barnes Co.

K. Electrical Equipment: W. B. Wigton, Cincinnati Planer Co.

Note: At press time H. Sahlin, of Sahlin Engineering Co., and Millard Romaine, Cincinnati Lathe and Tool Co., had agreed to serve as assistant chiefs of the Section, in addition to Don Laflin, first assistant. There are likely to be changes in this roster. Invitations are still being extended. Not all acceptances are firm. Some resignations are expected. All those serving will be asked to designate alternates.

Activation of Phantom Contracts Will Reinstate Distribution Order

WASHINGTON—Activation of the machine tool phantom contracts, in case of defense emergency, will automatically reinstate War II Distribution Order E-1-b, its text and provisions almost unchanged.

A complete stand-by staff of executives has been named to man the recently-announced provisional Metalworking Machinery Section of the War Production Board which would be set up simultaneously. Order E-1-b will be the keystone of the Section's control program.

The 100,000 machine tools, on which phantom orders have just been distributed, have been broken down into type categories, to meet the need for the kind of weapons and war gear dictated by anticipated strategy.

The breakdown has not been available for publication, because some officials feel that it might tend to hint at the armed services' plans.

Conclusions that might be drawn would be vague, because all of the 100,000 machines are general-purpose types. The 100,000 figure is merely a target; it is not an estimate of the potential requirement.

Planning Held Impractical

If any advance plans exist for production of special-purpose machines, they have not been revealed. Officials in charge say such planning would be generally impractical.

This emergency metalworking machinery plan, and the provisional administrative organization, have been developed as part of an overall equipment mobilization plan for the National Security Resources Board, by Brig. Gen. S. E. Reimel and Captain (Navy) E. R. Henning, both retired. The machinery plan has been approved by the Board and is now regulation, with the effect of law.

Reimel and Henning are the two pinch hitters who wrote Order E-1-b in a week at the high production point of War II, on the order of Ferdinand Eberstadt, then chairman of the Army-Navy Munitions Board, when the cumbersome priority system failed to work so far as machine tools were concerned.

E-1-b allocates 75% of machine tool production to the military services, and 25% to others, including foreign and civilian. Fixed percentages of the 75%, by types, go to contractors of the Air Force, Army Ordnance, Navy Ordnance, Bureau of Ships, etc.

The percentages were based originally on the relative volumes of orders in the hands of machine tool manufacturers from contractors producing for those military services. The percentages were and will be subject to change.

To Help All

Effect of E-1-b was to give all claimants a proportionate share of tools. It had been found that meeting the demands of those holding high preferences left other essential producers with none.

The machine tool industry at first opposed E-1-b, mainly because the lawyers had jargoned the text. When its terms were made clear, the industry promptly approved. Reimel and Henning say that industry comment now is strong for reinstatement of the order in an emergency. E-1-b decentralizes distribution, taking it out of Washington and putting it directly in the hands of producers operating under specific regulations.

Metalworking equipment manufacturers are not asked to do anything about the phantom orders they have received, other than study them and formulate plans for getting into production on short notice.

Cooperation Expected

NSRB realizes that attention given the dummy orders will vary all the way from zero to full and careful preparation. Nothing official was said on the point, but the writer believes that, human nature being what it is, companies who display real cooperation will be building good will where it might count.

In few if any cases will producers be loaded to capacity with dummy orders. But additional orders may be placed immediately upon activa-

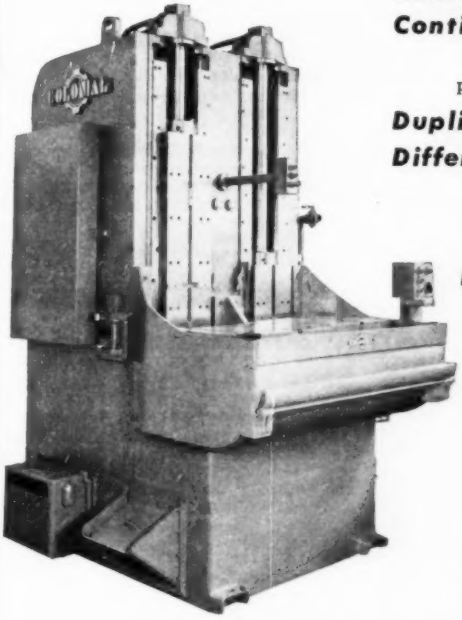
(Continued on page 278)

#1
+#2
+#3
+ ?

Another round of wage Raises?

OFFSET THESE COSTS with machines like these—

New COLONIAL DUAL-RAM Surface Broaching Machines



Continuous loading
Continuous cutting
with the rams
performing either
Duplicate operations, or
Different operations, on
the same or
different parts

Now further improved with

All electric controls

•

Preselective continuous or single cycling

•

Faster set-up

•

Minimum down-time for maintenance

•

Higher capacity

•

and a host of other operating and structural features.

Ask for Bulletin #RT-48

PIONEERS OF H.S.S. BROACHING

COLONIAL

BROACH CO. DETROIT 13

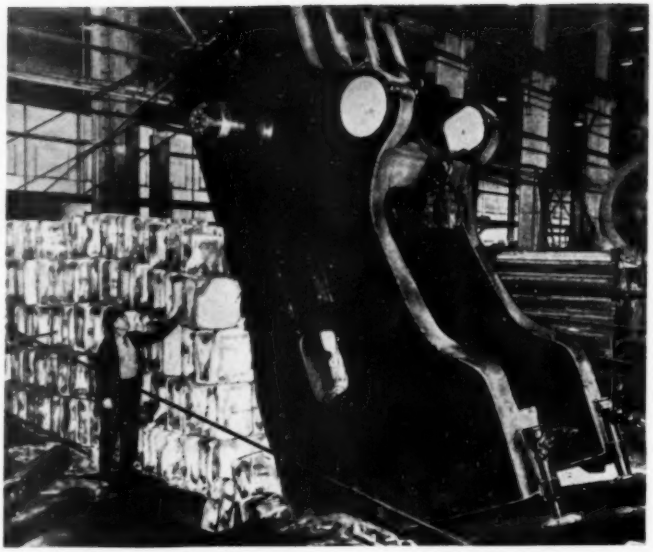
(Continued from page 276)
tion of the emergency program.

Some machine tool producers have made inquiries about scarcities of components, such as electric motors, that would hamper them from the start. The answer is that the industry will get immediate preferences on supplies.

Manufacturers would be asked to quote prices before activation of the orders. The objection has been raised that such prices might soon become inadequate, due to inflation. Unofficially the answer is that prices will be controlled or frozen immediately.

Other Categories Included

Besides machine tools, the metalworking machinery program includes gages and other precision measuring tools, abrasive products, cutting tools, cranes and hoists, foundry equipment and supplies, metal melting furnaces, industrial heat-treating furnaces and ovens, light power-driven tools, portable electric and pneumatic tools, mechanics hand service tools (files and rasps), chains. Surveys of these branches are under way; old control orders are being reviewed. Recommendations will be ready this spring. Pool orders probably will be issued on cutting tools and gages, and on other lines.



***SIXTY TONS OF ICE** did the work of a crew of men with heavy-duty cranes by tipping a 275,000-lb., 20-ft. high press to a horizontal position for shipment from Chevrolet's Muncie, Ind., plant to Detroit. Three-hundred and fifty cakes of ice were stacked behind the press and permitted to freeze into a solid block. Then the face of the block was chipped away and the press tilted against the angular surface. As the ice melted, the press slowly moved down flat*

Functions of NSRB, ANMB Defined

WASHINGTON—An agreement has been reached between National Security Resources Board and Army Navy Munitions Board whereby industry advisory committees concerned primarily with military commodities will be under ANMB, while those concerned with civilian goods will be under NSRB. The Machine Tool Advisory Task Committee, now functioning in the development of an emergency program, is under NSRB. But it can be, and is, used by both boards. Incidentally, there is a no-man's land of marginal commodities, which have to be allocated to one board or the other arbitrarily. Functioning of the boards will always overlap to some extent.

A joint machine tool preservation operation for the Air Forces, Army and Navy Bureaus of Aeronautics, Ships, and Ordnance, was recently suggested by officials of the National Security Resources Board. The Services insisted that each must have its own separate preservation organization, though it results in nonuniform practices and excessive costs. The Army alone has between 500 and 600 personnel on the job. Much of it is done by contract.

Survey of machine tool industry and allied production was done for NSRB by the Department of Commerce because regulations forbid contracting professionals' services when a government agency can do the job. Commerce did a good job, but far too elaborate. Some companies shied away from the questionnaire, as just another Washington nuisance, or maybe a tax catch. In such cases, officials known to the industry were brought into the picture. But in the end, response was near 100%. Some business men speculated that the cost of the survey by Commerce was much larger than a private trade service would have charged.

Army Substituting Light Metals For Steel in Many Military Weapons

WASHINGTON—A significant trend in the substitution of light metals for steel in many military weapons and other materiel is developing at the Army Ordnance Department's Aberdeen Proving Grounds.

Scientists and engineers at the Proving Ground in recent months have found that magnesium can be used in place of steel in gun-carriage wheels, cradles, spades and mounting brackets; in aircraft weapon mounts and in the weapons themselves; and in transfer and gear boxes and bracing structures in light vehicles. In the 155mm "Long Tom" cannon use of the light metal in the gun carriage has pared the weapon's weight by about 1500 lb.

Forged aluminum is being tried in wheels, axles, gun carriage trails, and as bracing parts on weapons, carriages, mounts and vehicles.

Many of the weapons themselves are being lightened by substitution of the light metals for steel. Of interest to the foot-slogging infantry is the development of lighter loads and more equal distribution of weight in the hand-carried, take-down weapons.

The light-metal studies, which daily are growing more important, started with requests from development groups interested in paring the weight in both airplane and airborne weapons and material. Early development of lighter aircraft weapons brought forth demands for the same type of work on weapons normally handled by ground troops.

The development work thus far has brought out many startling facts about utilization of the light metals, much of which the military is keeping under wraps for the time being.

VENDING MACHINES EARN MORE ...both in production and "on location"

. . . when machine-builders "buy the idea" of AMERICAN PHILLIPS SCREWS

PRODUCTION "PAYOFFS" climb up toward jackpot levels, where American Phillips Screws are policing costs in all assembly departments. Workers work faster and better. Shiny surfaces are never gouged. For American Phillips Screws and drivers are fumble-proof, skid-proof, slash-proof. And they can be handled *by anyone* with such ease and speed that time-savings average *50% over slotted screws.*

STEADY "PLAYS" are sure to be attracted by smartly styled machines, assembled with modern, attractive American Phillips Screws . . . the screws with the universal crossed recess. No burred heads to snag clothes. No loosening of screws under vibration and incessant use. And no matter what *you* make or vend, chances are you can profit *doubly,* too, through the production savings and merchandising power of American Phillips Screws. Write.

AMERICAN SCREW COMPANY, PROVIDENCE 1, R. I.

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AMERICAN PHILLIPS *Screws*

ALL TYPES

ALL METALS: Steel, Brass, Bronze, Stainless Steel, Aluminum, Monel, Everdur (silicon bronze)

New Boeing 200-hp. Gas Turbine Described at Annual SAE Meeting

DETROIT—More than 3,000 engineers participated in the annual meeting of the Society of Automotive Engineers Jan. 14-20 at the Book-Cadillac Hotel.

"Recovery—The Road to Peace" was discussed by Paul G. Hoffman, administrator of the Economic Cooperation Administration. He was introduced by President Robert F. Black of the White Motor Co., toastmaster at the dinner meeting.

Election of Stanwood W. Sparrow, engineering vice president of the Studebaker Corp., as SAE president was announced.

Of the new products disclosed at the meeting were the "Boeing 200-hp. Gas Turbine" by S. D. Hage, Boeing Airplane Co.; "Dual-Fuel Engine Development" by R. L. Boyer, Cooper-Bessemer Corp.; "Development of High-Speed Diesel Engines" by J. B. Fisher, Waukesha Motor Co., and "The Sheppard Diesel", an air-cooled small engine, by R. H. Sheppard.

Horning Award Made

Thursday afternoon Mrs. H. L. Horning presented the Horning Memorial Medal to A. C. Pilger, Jr., Tidewater Asso. Oil Co.

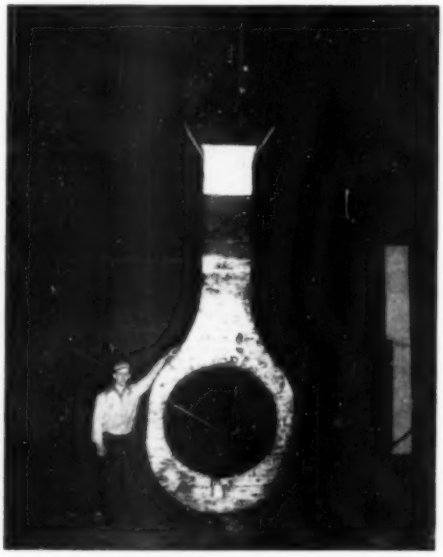
The paper by L. S. Fulton, Universal Cyclops Steel Corp., on "Forging High-Temperature Alloys" was one of the most comprehensive reports on the handling methods and problems which have developed in the fabrication of gas turbine wheels and buckers both for the compressors and turbines. He reviewed the alloys used: iron, nickel and cobalt base types; and the difference in handling them; type of hammers used; temperature required for forging and stress relieving; and the meticulous non-destructive method of inspection of the pieces from slug to finished product by magnaflux, zyglo, reflectoscope and X-rays to detect any flaws. Complete tables of the chemical constituents of each series of the three alloys were part of the paper.

Fatigue Life Cited

C. L. Stevens and G. Vennerholm, Ford Motor Co., in their paper on "Hot Steel Extrusions", emphasized the improvement in average fatigue life of 17.3% in such important parts as auto steering knuckles and rear axle shafts. They presented a diagram showing some of the manufacturing economies obtainable by the use of the extrusion process compared to the former drop forging of the same parts. These summed up as follows: 30% saving in the cost of steel due to using a lesser amount, seven machines versus 27 machines, 20% of the floor space required, 40% saving on die costs and only 35% as many were required. Better working conditions since induction heating was installed were cited.

The Boeing gas turbine development is particularly interesting because of its low hp. which heretofore has been considered below the possibilities of gas turbine design. This is not a jet-type unit but drives a power take-off shaft which would be used for driving a propeller or vehicle. It is particularly interesting in design because it has two turbines, one to drive the air compressor and the other the power take-off shaft. They are independent of one another. This gives the turbine characteristics which are most desirable in propelling any vehicle, namely maximum or 100% torque at start or stalled position and 50% torque at maximum hp. Reduction in number of parts and fewer wearing parts is remarkable when compared to a reciprocating engine of equal power: 175 part numbers in turbine as against 590 in engine; 220 parts against 1400; overhaul parts list 20 to 210 and those with close running fits 16 to 135.

Thirty-seven papers were presented at the five-day meeting.



***KNIFE PRESSURE** of 3 million lb. is provided in a new down and up shear that cuts one-half in. by 135 in. cold, or 6.5 in. by 38 in. hot aluminum. To assure the strength required in this service, huge links were forged by Heppenstall Co., Pittsburgh. The link shown weighs 21,000 lb. and is 17.5 ft. high and 5 ft. across the widest section. In the fabrication, flame cutting was employed to produce the 48-in. lower hole in the forging*

Russian Action Threat To Steel

WASHINGTON—Is Russia going to clamp down on shipments of manganese and chrome to the U.S.? The answer to that here is not a flat "yes" or "no"—but "maybe."

The question came up when it was learned that American importers were recently informed by Soviet trade officials that it might not be possible to deliver full quotas of the two ores, this year, because of "increased" requirements at home.

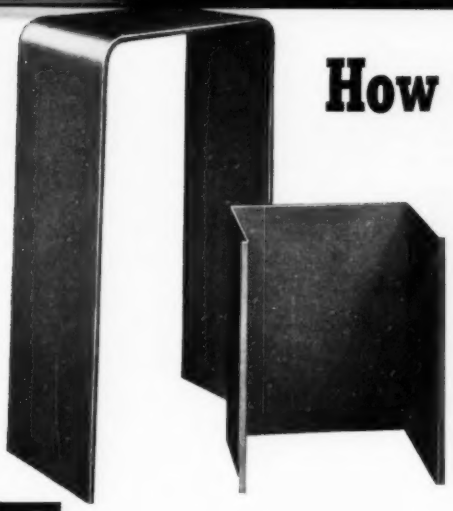
The stake in the answer to that question is 35% of our imports of metallurgical manganese, indispensable to steel production, and 40% of our imports metallurgical chrome.

Russian experts in Washington point out that Russia produces in the neighborhood of 2.4-million tons of manganese a year, of which half is exported. That leaves them far more than enough to supply their steel industry, which has an estimated capacity of 15-million ingot metric tons annually. So the experts laugh off the Russian statement that they have to cut down exports to meet greater home demand.

What is happening, they say, is that the Kremlin is floating a trial balloon; it wants to see how excited the U.S. may get over the prospect of a cut-off. At the same time, the Soviets figure that American importers and steel producers will put pressure on top policy-makers to relax export controls to Russia. That is already happening.

Top officials are now waiting to see if the Russians are bluffing or really mean business.

How to *Form* metal cabinets on a PRESS BRAKE!



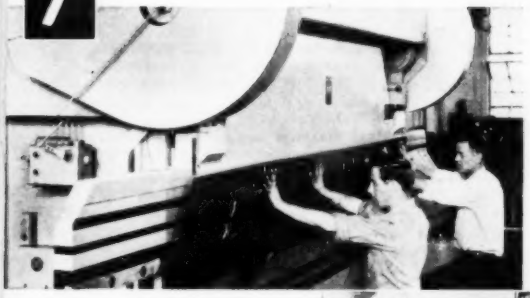
By extending bed and ram beyond the ends of the press and installing tangent bending mechanisms, BATH has added cabinet forming to the already wide range of functions of its STURDYBENDER Press Brake.

Now it is possible to do a complete job on one machine—blanking, perforating, notching, bending of flanges *and forming*. Obviously, this method provides a tremendous savings in the handling of materials, and eliminates the need for special forming equipment. The tangent bending mechanism is adjustable, to permit forming a wide variety of shapes. Cabinets for refrigerators, washing machines, deep freeze units, vending machines and other similar products are already being formed by this means.

Since more and more manufacturers are finding the STURDYBENDER tangent bending device an economical answer to their cabinet forming problems, you, too, may be interested in the details. A letter will bring full information.

The CYRIL BATH COMPANY
6910 MACHINERY AVENUE
CLEVELAND 3, OHIO

1



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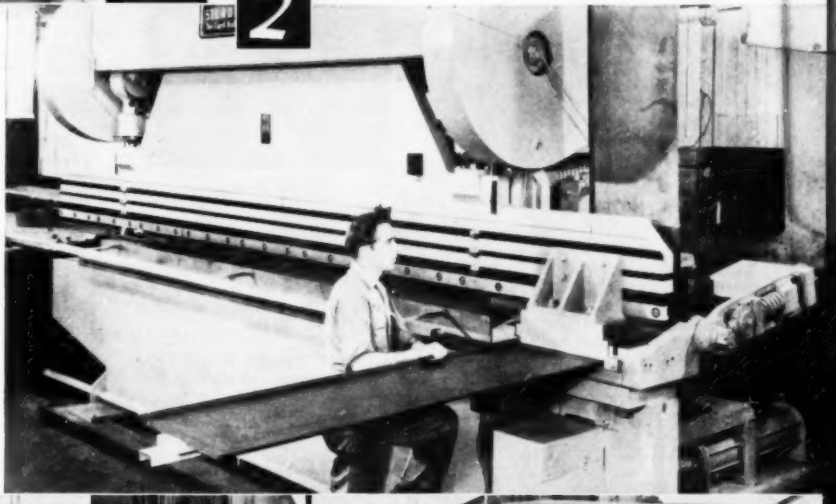
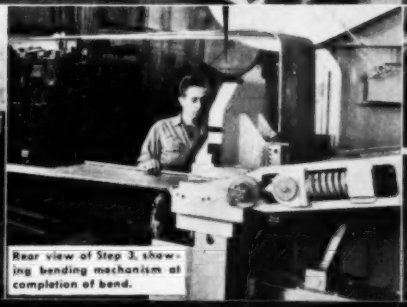


First step in production of refrigerator shell is forming 90° flange and lock flange on sides of flat sheet, conventional press brake operations.

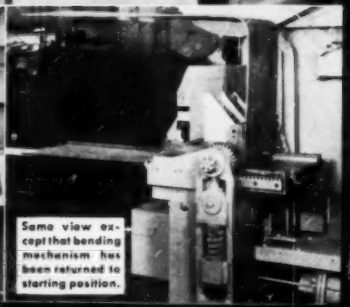
Sheet is then inserted in tangent bending device and the first top corner bend is made. Buckling or wrinkling of flanges at the corner radius is avoided.

Sheet is moved further into the machine and second corner is formed. Once machine is set up, duplication of parts is automatic and very accurate.

3



Rear view of Step 3, showing bending mechanism at completion of bend.



Same view except that bending mechanism has been returned to starting position.

Names in the News

George W. Binns

Alfred T. Blackburn

John B. Elfring

David M. Strauchen

David M. Strauchen has been appointed manager of a new special products division; **Alfred T. Blackburn** has been appointed general shop superintendent; **George W. Binns** heads up new developments; and **John B. Elfring** has been promoted from head of the tool design department to manager of production control, time study, planning and tool design. All these promotions are in the Cincinnati Milling Machine Co., Cincinnati, O.

Robert F. Ohmer has been elected president of New Wrinkle, Inc., and Chadeloid Corp. He will establish the main offices of New Wrinkle, Inc. in Chicago.

R. E. Whinrey, has been appointed assistant general manager of the Link-Belt Dodge plant in Indianapolis and **L. C. Heinlein,** formerly asst. superintendent, has been appointed superintendent of this plant.

Robert Brotherson has been appointed sales representative in Michigan territory, working out of his headquarters at 325 N. Hibbard St., Jackson, Mich., for Aerovox Corp. of New Bedford, Mass.

Joseph M. Tucker, former executive vice president of Massey-Harris, farm machinery company, has been elected senior vice president of Lustron Corp.

Murray L. Quartin has been appointed as sales representative for the New Haven Screw Machine Products, Inc., in Metropolitan New York, Long Island, and New Jersey, with office at 551 Fifth Ave., New York City.

Gordon P. Molsen has been appointed sales manager for their Chuck and Machine Tool Division of the Whiton Machine Co., New London, Conn.

Floyd Rose has retired as chairman of the board of directors of the Firth Sterling Steel & Carbide Corp., Pittsburgh, Pa., but will continue as an active member of the board.

George A. Daniels has recently been appointed secretary and treasurer of the Hydraulic Press Mfg. Co., Mount Gilead, Ohio.

J. C. Fink has been appointed manager of the industry engineering department of Westinghouse Electric Corp.

Roland Whitehurst, vice-president of the Electric Storage Battery Co., announces the consolidation of the Railway and Motive Power Sales activities, effective Jan. 1, 1949. **William Van C. Brandt** has been appointed manager of this new division to be known as Railway and Motive Power Sales.

J. A. Robinson has been appointed sales manager for the Transporter Division of Automatic Transportation Co.

Paul Hetenyi has been appointed consulting engineer in matters of engineering, production and application of its products of the Aerovox Corp., New Bedford, Mass.

Richard M. Somers has been appointed chief engineer of the Ediphone Division of Thomas A. Edison, Inc., West Orange, N. J.

Maynard B. Terry has been appointed vice-president of American Brakelok Division of the American Brake Shoe Co.

E. S. Coldwell has been elected president of Ford, Bacon & Davis, Inc., engineers of New York, Philadelphia, Chicago, and Los Angeles. He succeeds **James F. Towers,** who will actively continue as chairman of the Board of Directors.

I. W. Kokins has resigned as president of Telechron, Inc. because of ill health.

George H. Hodges has been appointed manager, Marine Dept. of the Babcock & Wilcox Co., New York, N. Y.

C. S. Gotwals has been appointed quality manager of all SKF Industries, Inc., Plants.

Hobart B. Harden, has been appointed manager of industrial division sales of the Wayne Pump Co., Fort Wayne, Ind.

Robert M. Whitney has been promoted to the position of advertising manager of the Automatic Transportation Co., 149 W. 87th St., Chicago.

Partial view of the D. A. Stuart Oil Co. laboratory where the "straight line to metal working efficiency begins."

Skillful Application of Job-Proved Cutting Oils

Metal cutting problems call for the best use of available skills and tools. The most profitable use of cutting fluids can only result from the close cooperation of the machine-operating engineer and the skilled and experienced cutting fluid service representative, backed by complete laboratory facilities.

The Best Combination To Help Solve Machining Problems

"On-the-job" tests, backed by D. A. Stuart Oil Company's 83 years of practical experience, result in cutting fluid performance dependably correct for even the severest machining conditions. Stuart engineers will gladly recommend the "right combination" to suit your specific working requirements. Write for the Booklet "Cutting Fluids for Better Machining."

D.A. Stuart Oil Co.
EST. 1865 LIMITED
2729 SOUTH TROY STREET, CHICAGO 23, ILL.

The Straight Line To Metal Working Efficiency

STUART *service goes with every barrel*

Robert L. Sommerville

Harry Reichert

Robert L. Sommerville has been appointed assistant general sales manager of Electric Storage Battery Co., Philadelphia, Pa. He was formerly manager of automotive sales.

Albert J. Doerman resigned as president of Titan Abrasives Co., Chicago, Ill., and has been elected chairman of the board. **Leo E. Jacobs** was elected president and director.

M. J. L. Schulte has been appointed general sales manager of Stow Mfg. Co., Binghamton, N. Y.

Gilbert R. Jarman has been appointed district sales manager of the St. Louis territory of Columbia Tool Steel Co., Chicago Heights, Ill.

Paul H. Burbage, Jr., for the past two years purchasing agent for Cornell-Dubilier Electric Corp., has been advanced to the post of director of purchases.

James J. Nelson, formerly sales representative, has been appointed Eastern Sales Manager of the National Bearing Division of the American Brake Shoe Co.

Bruce E. Horst has been appointed sales representative in the Rockford territory for Barber-Colman Co., handling machine tools, hobs, cutters and reamers.

W. Arthur Smith, Jr., lately engineering sales manager of Carlyle Johnson Machine Co., Manchester, Ct., has become New England representative of the Wel-Met Co., Kent, O., manufacturers of molded and sintered metal powder parts. His headquarters are at 1006 Main St., Hingham, Mass.

G. Henry Keeton has been appointed as exclusive Michigan representative for the sale of Marveco Live Centers for the Marvel Tool & Machine Co., St. Clair, Mich.

Harry Reichert has been appointed acting manager of foreign sales for Niles-Bement-Pond Co., West Hartford, Conn.

Clare C. Bostedor has been appointed director of programming and production control for the Lincoln-Mercury Division of Ford Motor Co.

Thura A. Engstrom, vice president of Continental Motors Corp., has been appointed works manager of the company's aircraft, automotive and industrial engine divisions.

Joseph F. Lask and **John L. Bradford** have been appointed general manager and sales manager, respectively, of Modern Collet & Machine Co., Ecorse, Mich.

BUSINESS ITEMS

Atlas Die Casting Co., Dayton, O., has been incorporated to manufacture die castings. Plans for a new building for the firm are being made.

Lempco Products, Inc., Cleveland, has completed sale of its 91st St. plant to **Yoder, Inc.** The plant, a one-story building containing 56,000 square feet of space, is being leased by Yoder, Inc., to the **United Tube Corp.** of Ohio, makers of mechanical tubing.

Kirsten Pipe Co. of Seattle, Wash., has been purchased by Prof. Frederick Kirsten and associates from George Gunn, Jr., who has headed the company for the past ten years. The company manufactures Kirsten pipes and cigarette holders which Prof. Kirsten invented.

Studebaker Pacific Corp. has four new structures and three and a half acres of extra land added to it in a $500,000 enlargement program of Studebaker's Los Angeles assembly plant.

Acme Steel Co. of Canada, Ltd. has moved their General Offices and Montreal Branch to new and larger quarters. The new address is 660 St. Catherine St., West, Montreal, Quebec.

The **Geometric Tool Co.,** New Haven, Conn., has announced the appointment of **J. E. Haseltine and Co.,** 2nd Ave. and Ash St., Portland 4, Ore., with branches at 510 First Ave. South, Seattle 4, Wash. and N. 1101 Division St., Spokane 11, Wash., as their distributors for the states of Ore., Wash., Mont., and Idaho.

Lindberg Engineering Co., Chicago, has established a new West Coast office at 5531 S. Vermont St. in Los Angeles. The new office will serve the states of Calif., Ore., and Wash.

Cutler-Hammer, Inc., pioneer electrical manufacturers, Milwaukee, Wisc., have announced the move to new quarters by their Indianapolis sales office. The new location is 644 E. Maple Rd., Indianapolis 5.

Landis Tool Co., Waynesboro, Pa., manufacturers of precision cylindrical grinding machines, announces the opening of a direct sales and service office in Indianapolis at 709 E. 38th St.

Robert E. Williams has been named director of production planning for Columbia Steel Co., with headquarters in San Francisco. **William G. Davis, Jr.,** has moved into his former position, superintendent of production planning at Columbia's Pittsburg, Calif., plant.

OBITUARIES

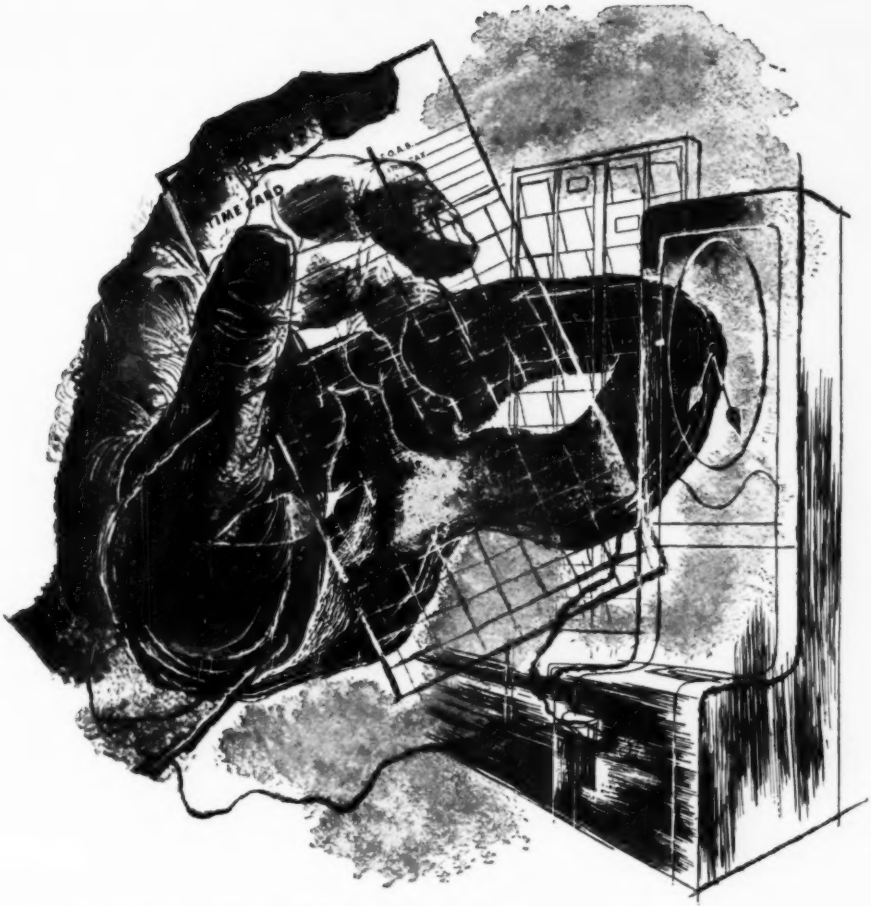
W. Wallace Kemp, president of C. M. Kemp Mfg. Co., 405 E. Oliver St., Baltimore, Md., died recently at his home in Baltimore.

Merle E. Tran, 52, chief metallurgist for the Park Drop Forge Co. of Cleveland, died Jan. 6. Mr. Tran, an outstanding metallurgist, had been associated with Park Drop Forge for 30 years.

J. William Ekegren, 54, secretary and treasurer of the Accurate Bushing Co. of Garwood, N. J. and well-known in the tool, die and allied industries, died on Dec. 17.

Charles H. Gallmeyer, 68, president of Gallmeyer & Livingston Co., machinery manufacturers and founders of Grand Rapids, Mich., died Dec. 31.

G. Hibbard, general manager and director of E. H. Jones (Machine Tools) Ltd., London, died Jan. 7.



Is this PROFIT THIEF on your payroll?

He's a slick operator. He's at work on machines in plants all over the country retarding production, eating away at profits, costing industry enormous amounts that *can* be saved!

Not in *your* plant, you say? Why not have a look? Today!

Are you still scooping grease from drums to guns with antiquated paddles? There's your profit thief at work—wasting time, wasting grease, risking dirt and contamination.

You can save 3¾ man hours for every 100 lbs. of grease.

Are you lubricating machines by hand—the old, time-wasting, risky, hit-or-miss method?

You can save up to 23.9 man hours in *applying* each 100 lbs. of grease.

Are you paying the price of "down-time" and lost precision for lack of the right grease at the right time?

You can make lubrication foolproof—make sure every bearing gets the right grease in measured amounts every time—even lubricate hundreds of bearings from one central point—while machines continue to produce.

How about it? Is this profit thief loose in *your* plant—on *your* payroll?

His label is "faulty, old-time, costly lubrication methods." Methods that are adding staggering sums to the already high cost of production.

There's one proven way to stop this loss.

An Alemite representative can tell you in 10 minutes how Alemite Methods will simplify and better organize your lubrication procedures. He can show you how mechanized lubrication from barrel-to-bearing will increase your production and profits.

Telephone your local Alemite distributor—or write to Alemite, 1899 Diversey Parkway, Chicago 14, Illinois.

ALEMITE

Reg. U.S. Pat. Off.

Another Product of STEWART WARNER

MODERN LUBRICATION METHODS THAT CUT PRODUCTION COSTS

they're like "growing pains"—HEALTHY

Every aggressive, hustling manufacturing business has tool problems. The business to feel sorry for is the one that hasn't any.

Bring your problems to Clark.

Just consider that here is as fine a set-up as you can find for practical tool research—Clark's multitude of machining operations in building axles, transmissions, wheels, housings, gears and forgings, fork trucks and industrial tractors, railway car trucks. If anybody should "know the score" on tools, we should—and we do. We build our own tools—Celfor Tools. None better—*we know.*

There's an easy, no-cost way to get all Clark's extraordinary experience working for you—just ask Clark.

CLARK EQUIPMENT COMPANY
CELFOR TOOL Division
BUCHANAN, MICHIGAN
OTHER PLANTS — BATTLE CREEK, JACKSON, BERRIEN SPRINGS, MICHIGAN

ROUND TABLE *Discussion*

DO MORALS AFFECT MORALE?

We must first assume that both parties are single and are therefore free agents. Should either be married, the answer is, "Yes, they do affect morale." It matters not how broad-minded people profess to be at heart, in practice we find them usually inclined to be narrow and not too charitable.

If both parties are single, we are faced with the following:

He must ask himself first: Do I want to be serious in this matter—or is it only "fun and games"? Why does she appear willing? Has she serious inclinations? Does she expect to be favored at work in some way? To boast to her colleagues, male and female, that she has the ear of the foreman? (Surprising how many do this.)

Or is it just fun and games for her too?

Good executives, no matter what their personal inclinations are, should always deal with personnel in a manner which is fair and just to all, and by so doing keep the name of management clean.

This does not mean that a charge of favoritism can be preferred because an executive gives important and interesting work to employees who are efficient and can work with little supervision.

Should the answer be that it's only "fun and games," then he should decide that such conduct is unfair, and will lead to complications which will be to his disadvantage in controlling his department.

The general conduct of the employee will show her own inclinations before she need be asked, if the executive claims to have had experience in handling labor. Should the answer be "yes" to any question except that regarding her own seriousness, then the attitude of the executive should be as above.

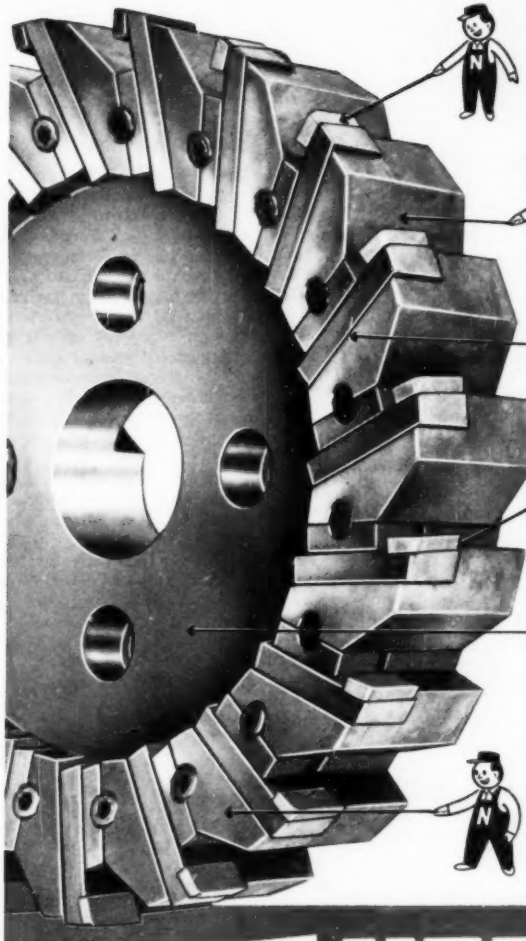
Unnecessary talking to an employee, particularly an attractive female, causes unrest and jealousy and is unfair to all parties. Persons who work together are unfortunately quick to sense an injustice even when none exists. The executive should, therefore, arrange for some mutual friend to introduce them at his home or such place as is convenient. Then if he finds that their feelings are still favorable, put the whole position frankly to her and

for HIGHER PRODUCTION . . lower down-time

HERE'S THE NEW (Series IB)

NELCO *Face Mill*

. . . that has all these features. Together they mean higher production at lower cost.



1

Tungsten—carbide tipped inserted blades, furnished finish-ground. Easily inserted heavy tipped tools mean lower first cost and eliminate waste carbide.

2

Larger chip room prevents clogging.

3

Radially faced with cutting blades set on beveled bases for perfect two-way alignment before grinding.

4

Exceptionally fine pitch results in high table feed.

5

All steel body for extra ruggedness.

6

Heat-treated tool-steel wedges and blades.

7

The same cutter body for milling cast-iron, steel, aluminum, brass and bronze. Cuts down tool inventory.

Write for the name of your nearest Nelco dealer and descriptive literature including sizes and prices.

NELCO TOOL

NELCO TOOL CO., INC., Manchester, Conn.

Saved: $400 the First Month on New Oil Costs!

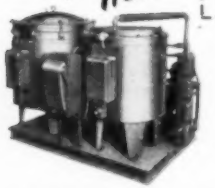
Actual Experience of a LARGE AUTO PLANT with the HOFFMAN OIL CONDITIONER

Reclaims RUN-IN, LUBE HYDRAULIC AND OTHER INDUSTRIAL OILS TO NEW OIL SPECIFICATIONS

Pays for Itself

During the first 4 weeks of operation, a prominent automobile manufacturer reconditioned 50 drums of hydraulic oil to a like new condition with the Hoffman Oil Conditioner shown above. A saving equal to the cost of 50 replacement drums of new oil was effected—for only $2.59 for one change in the filter cartridges. The savings in replacement oil costs alone will more than pay for the unit within eight months.

In your case too, a fully automatic, push-button controlled Hoffman Oil Conditioner will increase productivity—save maintenance and cut operating costs. Write for all the details NOW!



Removes Solubles and Insolubles

Complete purification of used oil is accomplished simply, economically and conveniently. Unit consists of Hoffman Cartridge Filter (to remove all insoluble material) and Hoffman Vaporizer (to remove all soluble impurities.) Portable if desired . . . filter and vaporizer may be operated together or independently. No steam or water hook-up . . . complete with all electric and pump connections.

Capacities for 50 to 600 g.p.h. Write for Bulletins A-667 and A-668.

FILTRATION DIVISION U.S. HOFFMAN MACHINERY CORPORATION
211 LAMSON STREET, SYRACUSE 6, N. Y.
CANADIAN PLANT: CANADIAN HOFFMAN MACHINERY CO LTD NEWMARKET, ONT

arrange for her transfer to another department out of his control.

The above is what should happen, but some years of experience have taught me that the average man and woman are not prepared to take advice on such a delicate matter.

We shall, therefore always have this situation arising in shops and offices where men and women work side by side.

The management will continue to apply "Nelson's eye," and I am afraid senior members also will claim the same privilege themselves.

I have found that a quiet talk and some friendly advice to keep it out of the works, should the situation appear to be getting out of hand, does most good.

J. A. Armstrong
England

•

PROSPECTING

Taking time off to look for another job answers two commendable purposes: It either enables the worker to get a better job—or it sends him back to his old one with the feeling that it isn't such a bad one after all.

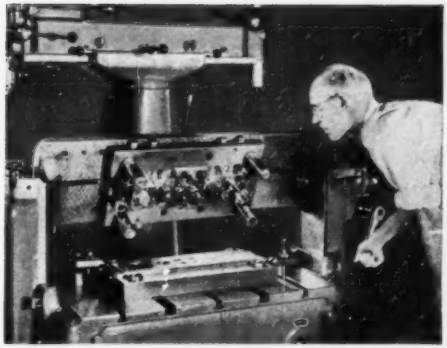
Whether the taking of the day off, without letting his boss know about it beforehand, is ethical or not is dependent upon the type of man in charge of the shop. Some foremen are reasonable-minded, while a few, thank heavens, are unscrupulous in their conception of what constitutes a workman's privileges.

A foreman who is prejudiced does not merit the confidence or consideration, while the one in charge who is open-minded and interested in the man's welfare, should be informed of the man's intentions. The employer who finds it necessary to let a man go on account of forced reduction of operating costs, should by all means let the man know a reasonable time ahead so that he can be on the lookout for another job. In fact, it would be to his own interest if he were to let the employee take some time off to look around immediately if it was found necessary to lay him off.

Deliberately ignoring the question of right or wrong when the employer has proven that he is on the square—that "Ah, to hell with him" attitude—is decidedly wrong.

I know of three incidents wherein workmen took the day off in order to look around for another job. One was given permission by the boss and on his rounds was offered another job, at more money, but the prospective employer insisted that he report to work the next morning.

Hand methods are slow and costly.



With the Moore Die Flipper 1 man does the work of 3.

Die assembling now mechanized

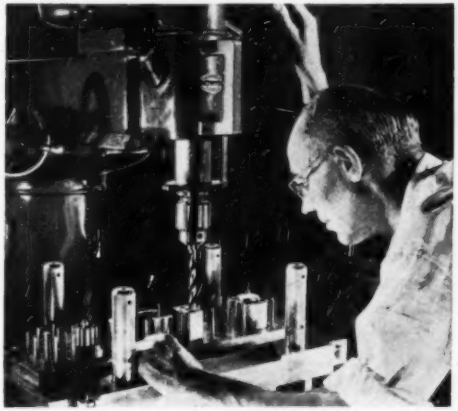
Is your toolroom still in the grunt-and-groan era of trying out and assembling large dies? Then it's time you investigated the revolutionary new Moore Die Flipper.

Without physical effort one diemaker can perform all the operations of die-assembling: Take apart, turn over, drill, tap and try out. The Die Flipper will be a money-saver in your toolroom from the start, for it can also be kept busy as a radial drill.

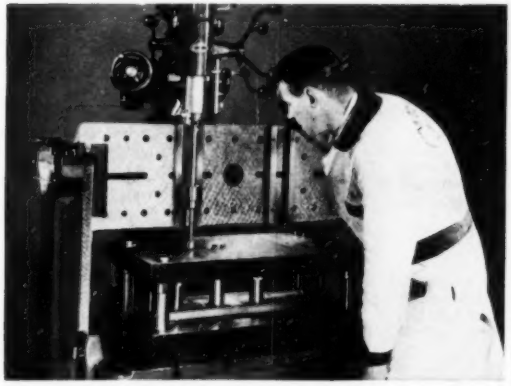
An eight-page catalog, with over 20 photographs and drawings, is just off the press. It's yours for the asking.

MOORE SPECIAL TOOL COMPANY, INC.

738 UNION AVENUE, BRIDGEPORT 7, CONNECTICUT

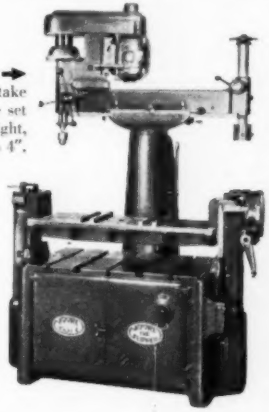


Drilling punch in place. Spring holes are also drilled. Radial drill has 1½" capacity. Tapping is done in same set-up with Lassy Tap Set.



← Counterboring for heads of screws tapped into punch flange, showing the use of ¾" chuck with long shank.

Moore Die Flipper stands → 5'x6'x7½' high. It will take apart and flip over a die set 20"x40" with 12" shut height, pins engaged in bushings 4".



ADD MOORE TOOLS TO YOUR TOOLROOM

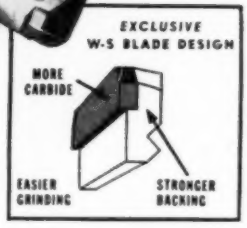
JIG BORERS **JIG GRINDERS** **DIE FLIPPERS**

PANTO-CRUSH WHEEL DRESSERS **HOLE LOCATION ACCESSORIES**

For better tooling at reduced cost

WENDT-SONIS carbide tipped *adjustable* REAMERS

Design of Wendt-Sonis Adjustable Reamers assures outstanding performance of reaming operations. Cuts are smooth and true to close tolerances. Generous chip clearance allows maximum stock removal. Only selected materials, carefully heat-treated, are used in W-S Adjustable Reamers.



REPLACEABLE CARBIDE-TIPPED CUTTING BLADES — A new tool can be had by replacing worn blades. One piece of carbide, heavily backed with high speed steel, runs the full length of blade. Diamond lapped cutting edges insure free cutting action — longer life.

ADJUSTABLE TO CLOSE TOLERANCES — Threads precision ground from the solid permit close blade adjustment. Maximum expansion allows greater number of re-grinds per tool. Special safety lock-nut permits easier replacement and positive locking of inserted blade.

AVAILABLE IN THREE STYLES — Straight shank, taper shank and shell type for reaming any type of material. Also available in right and left hand spiral flutes in straight and taper shank styles. A wide range of sizes for almost every reaming job.

Write for W-S Catalog No. 646 Revised

Contains complete details and latest prices on W-S Adjustable Reamers. Write: WENDT-SONIS COMPANY, Hannibal, Missouri; 580 North Prairie Ave., Hawthorne, Calif.; 1361 West Lake St., Chicago, Illinois. Warehousing Facilities: Eastern Carbide Corp., 909 Main St., New Rochelle, N. Y.

WENDT SONIS

CARBIDE CUTTING TOOLS

BORING TOOLS • CENTERS • COUNTERBORES • SPOTFACERS • CUT-OFF TOOLS
DRILLS • END MILLS • FLY CUTTERS • TOOL BITS • MILLING CUTTERS • REAMERS
ROLLER TURNING TOOLS • SPECIAL BITS

This, the job seeker refused to do because he couldn't possibly leave his old boss, who had always treated him squarely, without giving a reasonable notice. The second job seeker didn't think it was necessary to say anything about it because he felt that in doing so he would be, in the event that he didn't find another, pegged for dismissal by his old boss at the first opportunity.

The third case in mind was when the boss and the job seeker had had words about something over which the workman had no control. The fellow thought the boss had it in for him and decided to make it more comfortable for both by looking for another job. Consequently he took the day off without letting his boss know about the purpose of his absence. The man wore his soles thin going from factory to factory and finally gave up in disgust, and went back to work the next morning very much better in health and spirits! Not a word was said about the affair and eventually the disagreeable condition mentioned above was healed over. To say that the man was happy when he got back to his old job—even though the boss and he didn't play ball together very well—is putting it mildly, because jobs in a depression year don't hang on trees.

John Homewood
Ontario, Calif.

•

PRESENT—OR BRIBE?

Presumably, it did not occur to Al when he was sounded as to what form he would like the "present" to take that he could have gratefully, but firmly, declined or suggested some charity as deserving help. Ah, no; a wristwatch is a desirable gift, even though it has the stigma of bribery. Subscriptions forced? Surely, if a man subscribes because of fears of reprisal should he decline, he is a weakling. Maybe yes, but he who has the power to grumble and, possibly, to dismiss, is a man to be feared.

But is the giving of bribes as presents such an old custom? If an Al be leaving, getting married, or, has experienced some dire disaster, to offer some gift or help could be an indication of appreciation or sympathy. But need the memories of good and worthy old foremen, past and present, be libelled by quoting this form of bribery as an old custom? A Scottish proverb says, "greedy folk hae long arms," but the memories and traditions of these bygone foremen are too valuable to be sacrificed for greedy Als. Alas,

Design Ideas to Cut Costs of Wheels, Gear Blanks, Pulleys

THE examples shown are typical of the different ways in which wheels, gear blanks and pulleys are being built with arc welding. These basic designs can be modified to suit your production needs, depending upon the quantity to be made and the kind of fabricating equipment available.

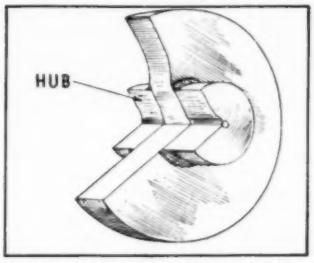


Fig. 1. *Simple gear blank* is made by fillet welding the hub to the web. Parts are flame cut from steel plate.

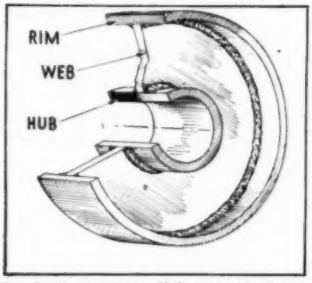


Fig. 2. *Alternate design.* Hub is machined from tubing and rim is rolled from steel strip. Hub and rim are fillet welded to web.

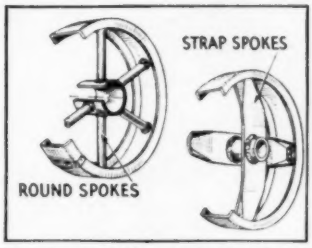


Fig. 3. *Low cost wheel* is made with spokes formed from round bars or steel straps. Spokes are fillet welded inside the channel rim. Hub if required is produced from steel tubing.

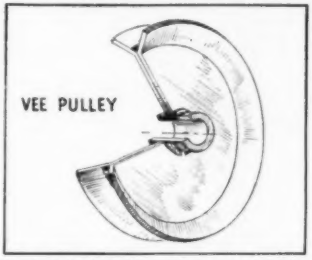


Fig. 4. *Pulley* is fabricated from two steel discs formed to produce a vee-shaped rim.

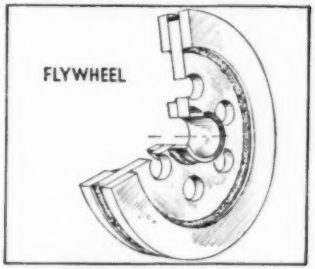


Fig. 5. *Flywheel* is made by welding two steel rims to web by a single groove weld. With welded design, metal is concentrated where it is needed most . . . at the rim.

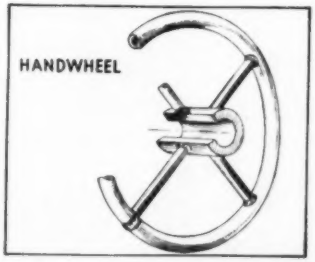
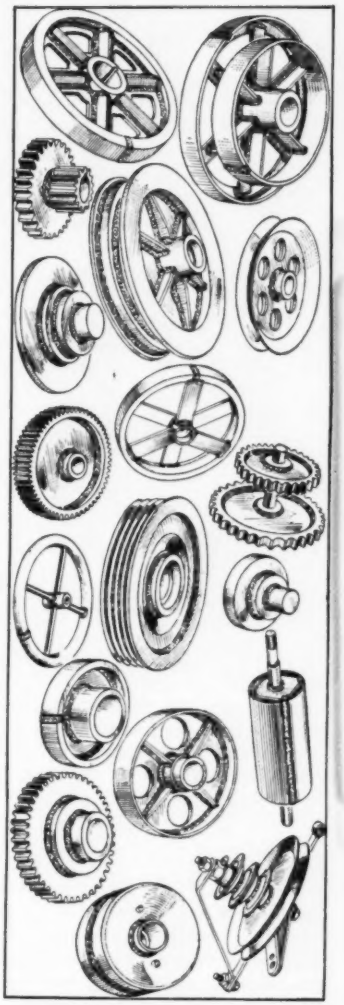


Fig. 6. *Handwheel.* Rim is formed from round bar stock or tubing. Spokes are plain round stock. Steel handwheels will not fracture from impact.



Detailed information on the design of all types of machine parts is contained in the "Procedure Handbook of Arc Welding Design and Practice." Price $1.50 postpaid in the U.S.A.; elsewhere $2.00.

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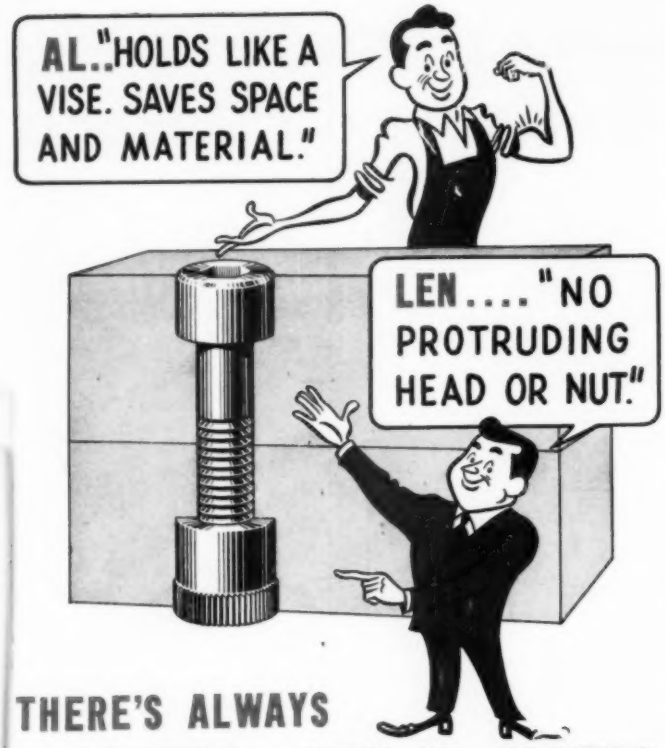

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how truly poor this kind of Al can be, wristwatch, hypocrisy and all! (Whose estimate of his own self-respect is 0 + 1 wristwatch and hopes of more gifts, perhaps.) Alas, poor Al!

J. E. Powell
Lindum, England

•

TOO GOOD

Working in several shops over a period of years, I have found that one's fellow workers, 80% of the time, do not appreciate one's greater efforts. One finds out he isn't "one of the boys," or he is "killing the job," or he is "money-hungry." This is especially true in piecework, or when the workers are females.

I think the worker should get something more out of it than the wages paid, as the effort is above average, but first it should be determined in the goal of this greater effort. Is a better job wanted, with increased responsibility, or only more wages per week? For what do his qualifications fit him?

Let's take my case as an example: During the war I was doing production work, producing a high percentage over the average day after day, and I also attended school after work. After a while, my job classification was raised, and I gained the attendant advantages of a better job, in respect to wages, duties, etc.

A worker who is "too good" could cause trouble by irritating his fellow workers, when petty jealousy is present, but things adjust themselves. Eventually the worker of a better class is removed, for, does not water seek its own level?

Edward Diskavich
Torrington, Conn.

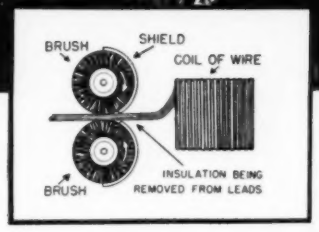
•

FACE-TO-FACE—OR BACK-TO-BACK

Ed is mistaken in his attitude with regard to an occasional talk by the employer. Years ago when companies were small the owner or manager could and did talk to the men easily. In small companies this is still possible, and in my humble judgment these talks are profitable to both employer and employee.

A lot of plants have abandoned these get-togethers because newer owners thought only of so many hours of production for so many hours in the plant. There is a vast difference between Old Billings who supervises his own shop and any go-between he can hire. He can talk in heart-to-heart fashion to men who know him personally and believe in

"QUICK STRIP ACT" on rotor lead wires stars OSBORN BRUSHES



Schematic Drawing of typical Wire Stripping Operation.

Wagner Electric Corporation Strips Wires Faster with Osborn Brushes, insures solid solder contact of rotor leads in commutator

STRIPPING formvar enamel insulation from copper lead wires in rotor fields to insure solid solder contact in the commutator is a feature performance at the Wagner Electric Corporation, St. Louis, Mo. Principal stars of the "show" are Osborn Ringlock Brushes with their cost-cutting act of stripping lead wires free of all insulation in a matter of seconds . . . with lead ends "clean as a whistle" for automatic soldering.

A special wire stripping machine provides a fixture in which a rotor is placed with wires extended and rotated at 8 R. P. M., forcing the wires between counter rotating Osborn Ringlock Brushes, revolving at 3450 R. P. M., that strip approximately 1 in. of insulation, 1½ in. from the end. Rotor is then removed from the fixture and the lead wires trimmed to length within the cleaned area.

This is just one of hundreds of industrial applications in which Osborn Power-Driven Brushes are playing a stellar role. If you are faced with rising production costs it will pay you to investigate. There is no obligation.

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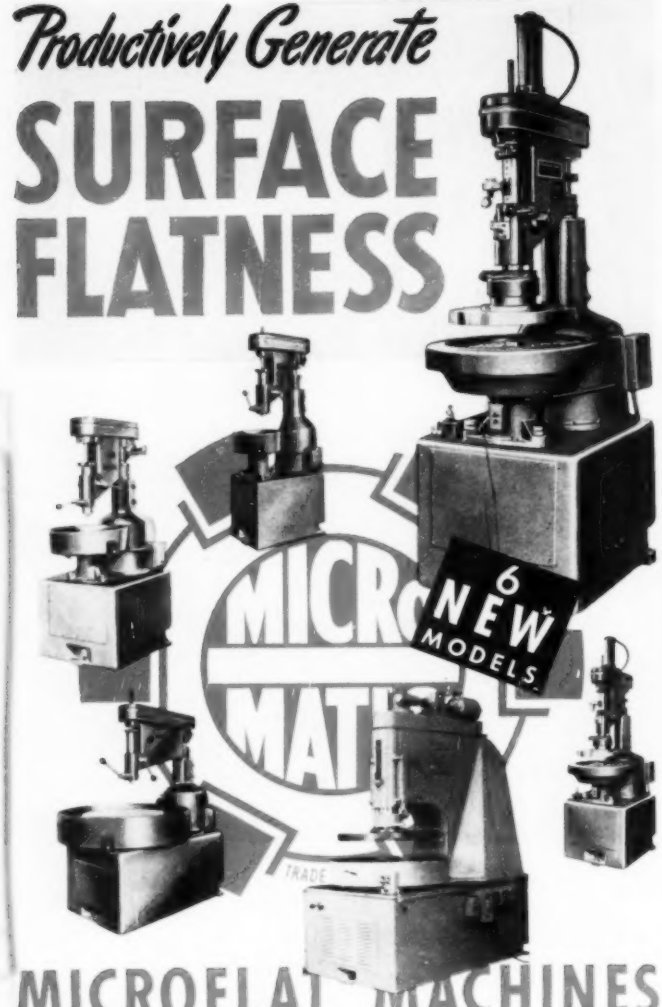

MICROFLAT MACHINES

This cast iron valve plate for a refrigeration unit is finished on a double surface Microflat Machine to 8-microinch r.m.s. finish—optically flat and both sides parallel within 0.0001-inch. Production rate is 20 pieces per minute.

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him, but these men would not be interested in what any go-between would have to say.

I have worked in several owner-manager concerns where the boss talked with the employees at least every five or six weeks. You could ask the boss about practically anything and could suggest anything and get an answer right away. None of us ever thought the boss lowered his prestige by talking to us and none of us liked a boss who was aloof and stand-offish.

In a big company, the individual worker tends to be lost in the crowd and the executives don't know him. If a worker is ill or dies, only his immediate associates know about it. I think it is the job of the management to find out about such things and show a personal interest so that the human touch is not lacking entirely. It is one of the greatest possible mistakes in policy to have supervision aloof from the supervised. This is being recognized and nowadays most executives and supervisors are instructed to be reasonably friendly toward employees and there is no criticism when they are.

Similarly there is every reason for the employee to be interested in what Old Billings had to say. In the first place, Billings probably worked his way up the hard way, so it would pay the workers to listen to his advice. He knows their problems and could help them when they run into difficulties. Furthermore, he probably lives and acts very much as they do, so they feel he is one of them. They don't feel any difference in social level, and this factor is of prime importance in handling any group of people successfully.

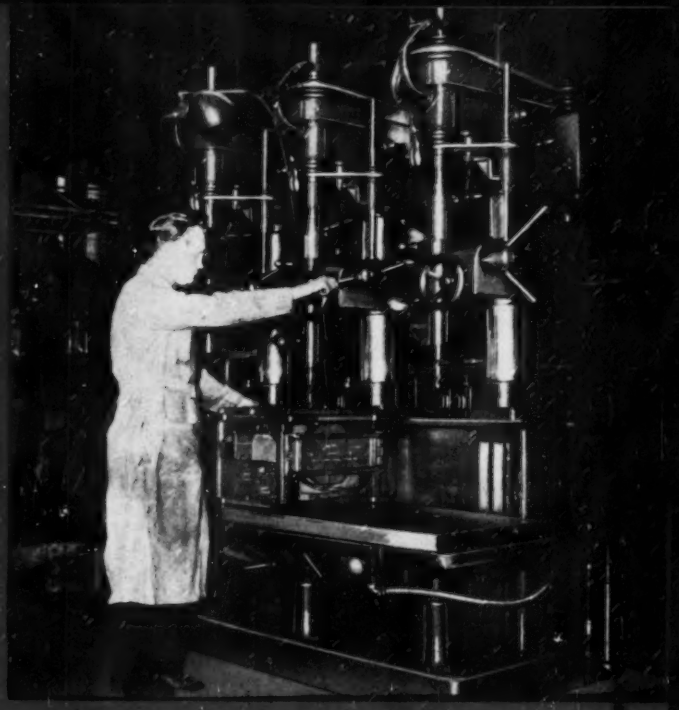
Arthur Silvester
Niantic, Conn.

•

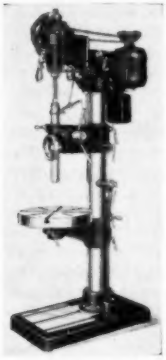
There should be no hard and fast rule governing the advisability of meetings between top-side and workers for the mutual discussion of factory problems. A happy arrangement would envisage the Old Man talking directly to the men whenever the opportunity justified such direct contact, and also employing skilled go-betweens such as the shop foremen to implement management policies and directives in the usual course of business. The old-time direct-contact method practiced by men like Schwab is not obsolete, and should be employed to a greater extent in present-day industry.

Sound advice from the top-side to the assembled working force, covering some pertinent personnel policy,

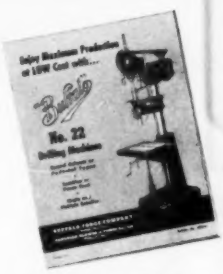
Easy Handling -Fast Set up Changes



Speed up the LARGE DRILL Operations with "Buffalo" No. 22 Drills



● Drilling up to 2″ holes in cast iron no longer requires a cumbersome, hard-to-operate machine! The "Buffalo" No. 22 Drill combines the necessary rigid strength for such drilling with quick maneuverability of controls. Many manufacturers are slashing time and costs on large holes with this accurate, easily handled machine. Available in single or multispindle models, as your operation requires.



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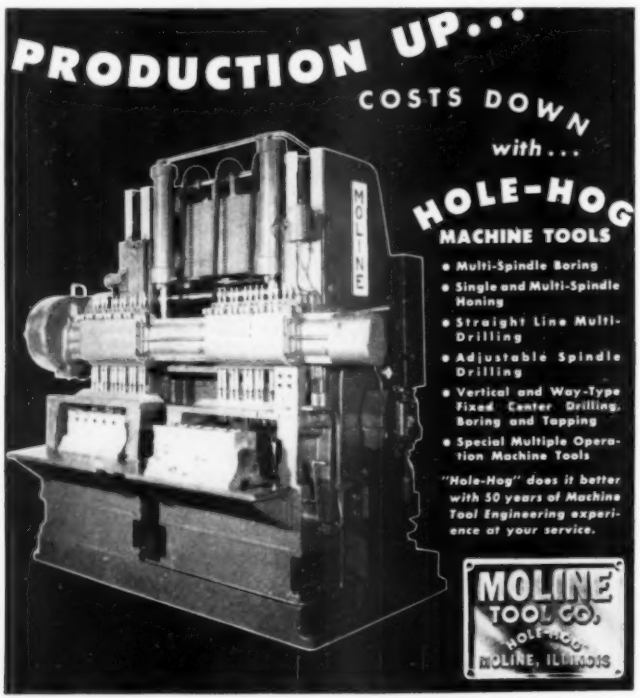
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or mutual business information, aids both management and labor in bettering production. The boss is not making a mistake in mixing with his men. A personal contact is the cement that binds the loyalty of the men to the best interests of the company. By coming out in the open and discussing with the men the business conditions which have direct bearing on the continued success of the company, and eliminating of adverse influences on the life of the organization, the boss can make the policy of the company clear to the employees. The fallacy of building an iron curtain around the top side has been demonstrated in lack of understanding between employees and employer. The iron curtain of misunderstanding can readily be raised by personal contact.

"A cat may look at a king," and the head of a plant should be readily accessible to his employees and frequently make personal contact with the men who work for him. The direct approach will make the worker feel he is part of the organization and inspire him to greater productivity. Plans for increasing production may be mapped out in the front office, but it takes the added personal touch of management to spark the effort toward a successful conclusion.

It is true that the foremen should be skilled go-betweens in the management-labor set up, but good bossing stems from the top. In one plant where lagging production was the object of an investigation, it was soon obvious that the Big Boss himself was the main problem. He was accustomed to giving orders with no back talk, making decisions abruptly without consulting anybody, and snorting fire whenever anything went wrong. When some of the first principles of good bossing were tactfully explained to him, he fortunately saw the light and soon was inviting critical suggestions from his subordinates and giving them more credit whenever they did good jobs. A new atmosphere of cheerful friendliness permeated the plant. Within a half-year the high turnover of skilled employees declined sharply and production began to rise.

Some old-line bosses will assure you that all this business of direct contact with the men and using praise and diplomacy on subordinates is dangerous nonsense. Give a man a pat on the back, they say, and he will hit you for a raise the next day. Actually, it does not work out that way. Employees in modern industry are realistic. They understand that the boss is bound by budgets and set pay schedules and will do

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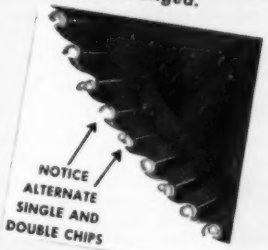

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An almost endless range of difficult requirements can be met by M & M circular cut-off machines. Special models are being built to handle practically any material, ferrous or non-ferrous; round, square or structural . . . always with Triple-Chip advantages: faster feeds and record-breaking speeds; clean, square, accurate lengths without burr; longer blade and tool life. Also, Motch & Merryweather is building special "many-in-one" models which combine cutting off with threading, center drilling, reaming, facing, chamfering and turning. Our technical staff will be glad to design a combination machine for you which will pay for itself and go on to show a handsome profit in 1949.

What, sir, are your requirements?
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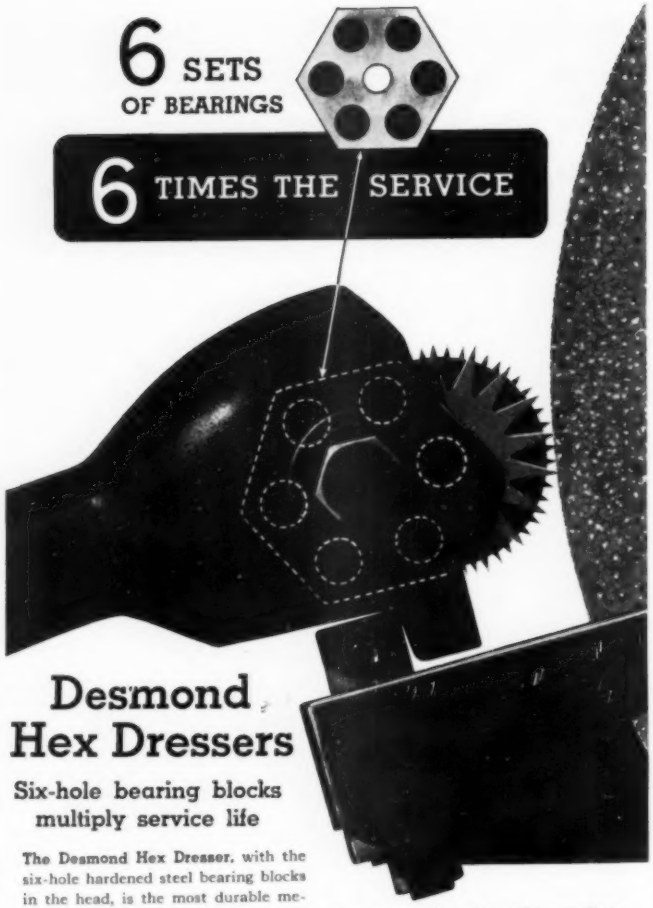

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Six-hole bearing blocks multiply service life

The Desmond Hex Dresser, with the six-hole hardened steel bearing blocks in the head, is the most durable mechanical dresser made. As one pair of holes wears, merely turn the block to a new set. No wear on the handle. When all six sets have been used, it's a simple matter to loosen the side screws, remove the cutter assembly and replace the blocks. Made in five sizes and using Huntington cutters of corresponding size.

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the only complete line of grinding wheel

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BALL BEARING DRESSERS | REVOLVING CUTTER TYPE DRESSERS | DIAMOND HAND TOOLS AND NIBS | WHEEL TYPE DRESSERS | SIMPLEX STEEL-SLIDE VISES

only the best he reasonably can for them.

When all businesses were small, an employer knew all his workmen intimately. But as manufacturing enterprises grew larger and the problems of industry became more complex, it became necessary to divide these duties into parts. However, one of the primary fundamentals of organization is regard for the personal equation. The old-time direct-contact method has the power to enthuse the men, to get them to cooperate and work as a team. It does not break down the boss's influence if he comes out in the open.

In modern industrial management, with its developed lines of supervision or responsibilities and fixed organization, the combination of a good and strong driving force from the top and well-developed fundamentals of organization through the ranks is one of the best organization bases which can be found.

It has been said that a proverb is a short sentence based on long experience. The demonstration of the efficacy of the proverb "One good turn deserves another" has been proved in the case of Schwab and other industrial leaders who practiced the direct-contact method of talking directly to their employees and treating them as important persons in the success of the organization. The workers usually responded to these good turns by giving their best to the company.

Harry Kaufman
Philadelphia, Pa.

•

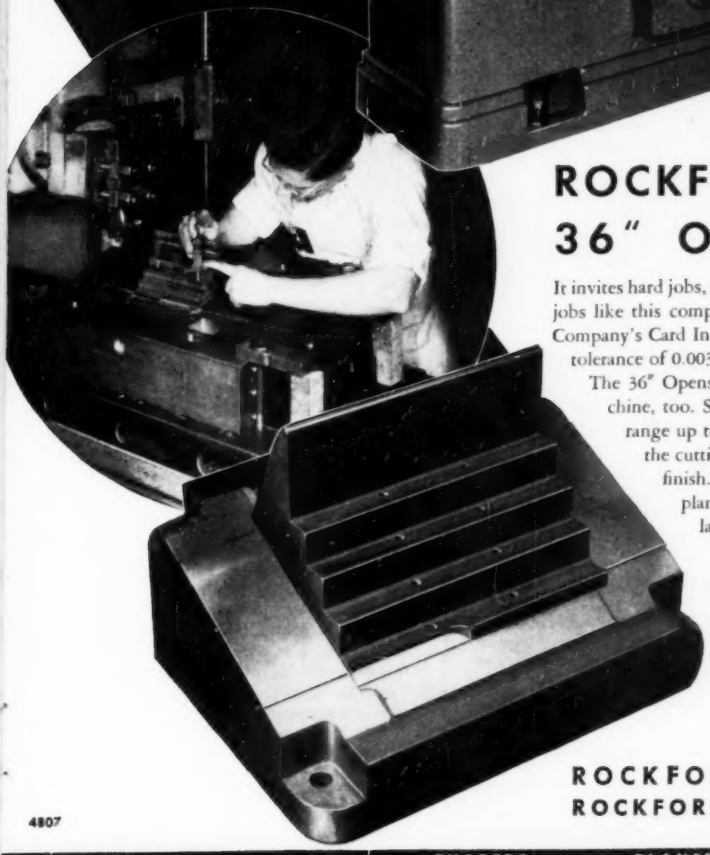
Ed's attitude that management loses something by "coming down off the pedestal" to discuss policies in chats with the men, or to inform them of what may be expected and their (the workmen's) part in it, is far too prevalent today.

The pendulum may have swung well over, even "left" of center, since the day of Milford and the serf, but the urge on the part of too many to bring it back is probably to blame as much as any one thing for the breadth of this swing.

Say what you will of caste systems of other countries, there is no more despicable snob than the first-generation "nouveau riche" American. This has nothing to do with the oft-overplayed characterizations of flamboyant clothing, loud lack of manners, flinging about of money. These are to be expected, condoned and forgiven and as a return for years of "blood, sweat and tears"—justly earned. It is the complete change towards the fellowmen that

WANTED:

Tough Assignments for this machine



ROCKFORD *Hy-Draulic* 36" Openside Shaper

It invites hard jobs, the kind that are too difficult for ram type shapers . . . jobs like this compound angular die for Burrough's Adding Machine Company's Card Index Case . . . cut out of tough die casting steel to a tolerance of 0.003".

The 36" Openside Shaper is an exceptionally fast production machine, too. Set-ups are quickly and easily made. Cutting speeds range up to 110 ft. per min. and are infinitely adjustable, with the cutting stroke maintained at uniform speed from start to finish. Reversal is quick and return rapid. Full-length, planer type table support permits machining of very large or heavy work . . . and assures exceptionally high precision cutting, often eliminating the need for further finishing operations.

It will be well worth your while to find out how a Rockford *Hy-Draulic* Shaper, Planer, Shaper-Planer or Slotter might speed up or improve operations in your shop. Send your blueprints to our engineering department and we will furnish machine time estimates for comparison.

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SHAPERS

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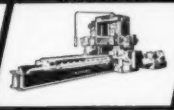

SLOTTERS

SHAPER-PLANER

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"CLEVELAND REPUBLIC" DRILL UNIT

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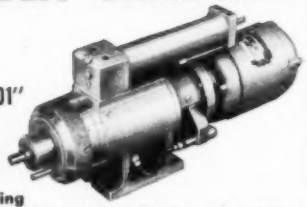
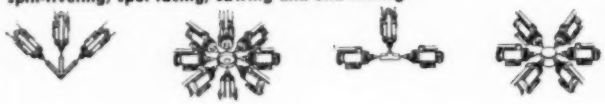


The ingenious simplicity of engineering design in the CRT Power Unit brings a lifetime of performance in many production operations. Use its' controlled power for drilling, chamfering, spin-riveting, spot facing, sawing and end milling.



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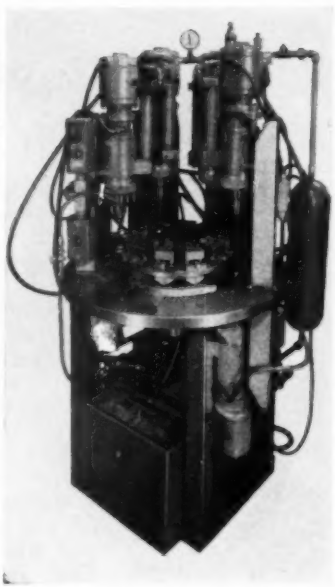

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is unforgivable. A lifetime is short but still overlaps several generations, each with its own opinions to form. Regardless of the age of life at which this change to the "upper class" is made, there are always those who "remember when." However, the quarrel is not limited to homefolks nor the small business man, but extends just as readily to those whose dealings become nationwide.

It seems at times as though there is a sinister warning for the future of American industry in the failure of these men to realize when faced with labor troubles, that where there is smoke there is, for a certainty, fire! Why are they afraid to go among the men with their hopes, problems or prayers? Because a man's sole investment in business may be represented only by his toolbox or a bundle of greasy overalls is no indication of the depth or sincerity of his interests. When the directors despatch a circular letter to the stockholders, they make no distinction in the telling between those whose shares are large or few in number. Such being the case, it is a little confusing to see this catering on the one side and what amounts to a snub on the confusing other.

To suggest that a man who has 25 years of service in a company—or only five—who is bringing up a family in the community of which the firm is a part, is not interested in what is going on in his firm and need not be told, is beyond belief.

Now, Ed, you've been around shops long enough and with the men often enough to know that Joe Blow is not altogether stupid. He may not be able to write his name legibly but he has as much pride in surroundings in his home, in a job well done as the rest of us. He likes to feel he's an important link in whatever is going on, and since this feeling is an intangible, it needs a certain amount of feeding or even "needling" from someone else. He likes to feel that, as he's been told, those above him are cut from the same cloth, know and have the same problems. Just because the boss stops for a chat, calls him Joe, says once in a while, "We're all one big happy family," doesn't mean Joe and the Mrs. are going to drop in on a Sunday at the boss's country estate. Although there have been such cases but to my knowledge of one instance, the boss, nonplussed for a moment, rose to the occasion and carried it off. He didn't lose by it, but gained a lot. Not that Joe or his fellows made a practice of it, nor would its encouragement be suggested, but

Joe saw for himself that the boss was human, something he already knew, from shop contacts. Joe, knowing this will spread it, giving the lie to the statement by some that "that sort of thing only works for one-horse outfits—you can't talk to everybody in a big place like this." Admittedly you can't, but a boss who tries can spread himself around a lot and by talking to one man in ten individually, or ten men out of a hundred in a group, a hundred out of a thousand and so on, can make each one of these fellows personal representatives, chaps who'll always step forth in a "bull session" and say "Why I *know* Mr. Big and you can bet he'll . . . . . ." No, Ed, you'll never convince anyone—least of all the boss himself—that he'll lose anything by having a chat now and again with the boys, "Face to Face—not Back to Back!"

A. M. Elliott
LeRoy, N. Y.

•

REST FOR THE WEARY

This business of watching to see that the men don't sit down while working, when it happens, can be overdone. Nobody likes that. But many men, like myself, prefer not to sit down. I think one works better when tensed up and not relaxed. If the work is low, such as layout work on a bench requiring a stooped or bent-over posture, the case is different. Here it is better to sit down.

There is a certain shop in California in which the foreman, who also happens to be its owner (the place is rather small), thinks that if a man sits while running one of the ordinary shop machines, such as a lathe or shaper, he just isn't doing his level best. That's how it seems to me. Even if the work is a long run, just sitting there looking seems like a waste of time. I don't think any man with anything "on the ball" will do that anyway. I know others don't agree with this viewpoint. I've seen plenty of machinists draw up a chair at a lathe or shaper and make themselves comfortable, and they got away with it. The practice is too common.

On production machine work, this isn't allowed. Two or three machines run by an operator is ordinary practice, when possible. A machinist who *works* does what he can with every possible minute, too.

Of course, certain modern machines are made to be operated while sitting, and no harm is done, but I'm considering here only personal shop habits. Sitting down occasionally does relieve fatigue, as long as it

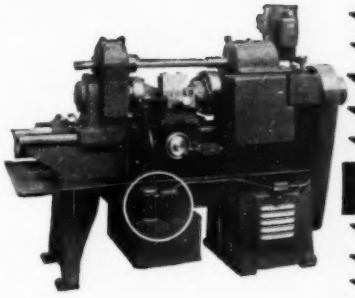

Photo Courtesy The R. K. LeBlond Machine Tool Co., showing a LeBlond #1 Crankshaft Lathe with 1/10 HP Model 1-P3 Gusher Coolant Pump.

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is not overdone. That is all right. But it seems to me the mid-morning and mid-afternoon rest periods take care of this very nicely. . . .

Edward Diskavich
Torrington, Conn.

•

To me there is no earthly reason why a man should have to stand on his feet when waiting for the end of a long cut. Many individuals suffer from varicose veins and it behooves one to get off his feet every chance he can if he is so afflicted. Personally, I can't do justice to my work when I am sitting down, unless I am taking one of those prize packages that come to one in the form of a long, time-consuming cut. I feel more able to perform with greater efficiency when on my feet. I've seen fellows put work in the chuck, go about various operations—boring, facing, turning, and what not; and then after the machining is all finished to remove the job from the machine and brush away the chips. All this, mind you, while spreading out their posterior. I couldn't do it, not because I am not of the spreading variety, but simply because I have a peculiar sense of accomplishment while standing up.

I dislike doing this, but I must cite a personal experience again. As a young fellow, when my pegs were as sound as a baby's, I hired out at a plant and when they led me into the toolroom I noted, particularly, the ease with which every man was conducting himself. To me I seemed to have entered into a new industrial world. Twenty or more men were seated at their benches, the fellows at the milling machines were thoroughly enjoying life with one knee over the other, and, last but not least, the fellow at the hacksaw was seated awaiting a piece to be cut off. "Ye gods!" I chuckled as I noted that every man at a lathe was well entrenched on a four-legged footrester. "Oh, baby!" says I as my toolbox was placed on a bench. "I hope we never have another depression—I'm going to stay here for the rest of my life!"

One of the first jobs the boss gave me included in its many parts a long shaft which would enable me to have an easy time of it while it was being turned down most of the way. Naturally I followed suit and got myself one of those rearendus things and dragged it over to a Hendey—my favorite. I looked all over the place for one with a stuffed leather top, but strange to say there was none around—the boss had one

but I didn't want to ask him for his. I started out my cut with a speed that I thought would conform to the general atmosphere of the shop, and in about five minutes afterwards the foreman came strutting by to see how I was making out. "Look here, young man," says the Bull of the Woods, "we do better than that with Yazinski steel—step her up." "You're the boss," says I as I kicked the stool from under me and reached up to flip my belt. The smoke of intense production was raised as I proceeded to follow my own way of working at the lathe. I smarted somewhat from the reprimand, but lived through to enjoy a thoroughly happy session of working for one of the finest men I have ever had the pleasure of standing on my feet for.

No, a stool has its place in industry, but when a fellow has to sit down all the time he's likely to get very much out of balance.

John Homewood
Ontario, Calif.

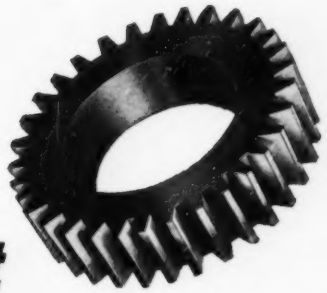
•

Where the design and arrangement of the machines permit, management will find it good business to provide seats for machine operators. Relief from unnecessary fatigue provides an economical means for increasing production. Instead of inviting relaxation, the provision of a place to sit down will demonstrate the company's concern for the well-being and continued activity of the worker. In most instances such consideration will hardly be abused.

From a psychological standpoint, the fact that the worker knows he does not have to perform all operations standing will put him in a frame of mind in which the successful pursuit of his duties will occupy all of his energies. On the other hand, where no place to sit is provided, some grousing and ill-feeling against the company may result, with subsequent divergence of the worker's energy and concentration.

Provision of seating arrangements for machines involves study of the layout. Layout of equipment should be planned so the operation involves as short a move as possible. However, it has been proved the poorest kind of policy to save space at the expense of men or materials. Many managers have made the mistake of crowding the operatives, only to find that subsequent loss of production per worker was far more costly than a comfortable layout would have been.

Equipment must be thought of as everything, except material, with



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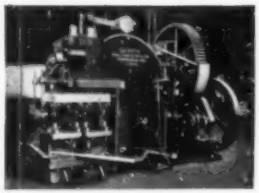

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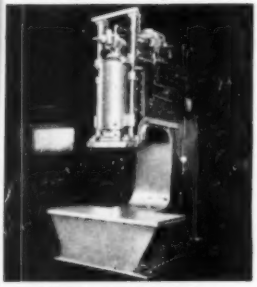

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which the worker is provided to aid him in the performance of his task. For example, where the arrangement of machines permitted provision of seats, the standardization of the worker's chair, particularly from the standpoint of proper height, has been given much study. In a factory where the work permits sitting, it will be found that if the management has not provided chairs, the workmen have improvised seats out of old nail kegs and packing cases, or have made themselves rough benches or stools.

If the chairs are really an aid to the work, they should be furnished by the management and as far as practicable these chairs should be scientifically standardized and suited for the purpose for which they are to be used.

The adjustable-height, back-fitted chair has been found useful. Proper height of workplace and chair depends largely on the nature of the work. Generally speaking, on heavy work, it is desirable to keep the lifting distance small. On the other hand, workers seated on ordinary chairs should not be required to bend too much or when the material handled is quite light, it may be profitable to allow the height of workbenches to be determined by the machine-bed level of nearby machines. Transfer trucks or tables on wheels of the same height can then be employed and the bench hands provided with higher chairs.

One of the most satisfactory forms of factory chair has a broad saddle seat, adjustable legs, and close-fitting back, which makes it exceptionally effective for machine operation. However, it should be noted that the provision of seats alone will not control fatigue of the workers. Fatigue elimination has largely consisted of the bettering of equipment, as well as the elimination of useless and tiring motions, as developed by job study.

Nature is wonderful: A million years ago she didn't know we were going to wear spectacles, yet look at the way she placed our ears. Similarly, other parts of the human anatomy are so constructed that a "seat for the weary worker" becomes a necessity for some workers in reducing undue fatigue. However, a good operator will assume the position at work most convenient to himself and suitable for the demands of the particular job he is engaged upon.

Of course, there are some workers who would be more spic if they had less span. This type usually finds that provision of seats is a vital necessity. The spirit of those men may be willing but the flesh is weak. They say

a worker is old-fashioned if he likes to stand. It will be found through experience that the modern efficient machinist has little need for a seat in operating today's automatic machine tools. The complexity of the equipment requires the constant attention and attendance of the operator. Unless the layout and arrangement of the machine permit it, a seat would be a hazardous and cumbersome appendage.

In my opinion, if a vote were taken, in an average individual shop, on the provision of seats for machine operators, the majority of the men would honestly disapprove of such seats on the grounds of being detrimental to the safety of the operator as well as the operation of the machine. Today's operator knows he must be alert and attentive in running the modern machine; he must be near and have ready access to the controls. A seat would, in most instances, be in the way, and might spoil work and present a hazardous condition, resulting in possible injury to the worker.

Harry Kaufman
Philadelphia, Pa.

•

My opinion, as an old-timer and former owner of a repair shop, is: as the average lathe is built to suit the average height of the man, standing up, who runs it, a stool, something like the kind used in bars or lunch counters, could be used. But the efficiency of the worker would be doubtful, as he would have to pay some attention to its continual adjustment, aside from the annoyance of getting its legs all tangled up in the chips and ending up by losing his balance, getting a fall, injuring himself and spoiling the job. Therefore, no sitting down at the average lathe job. The same goes for the rest of the machine tools.

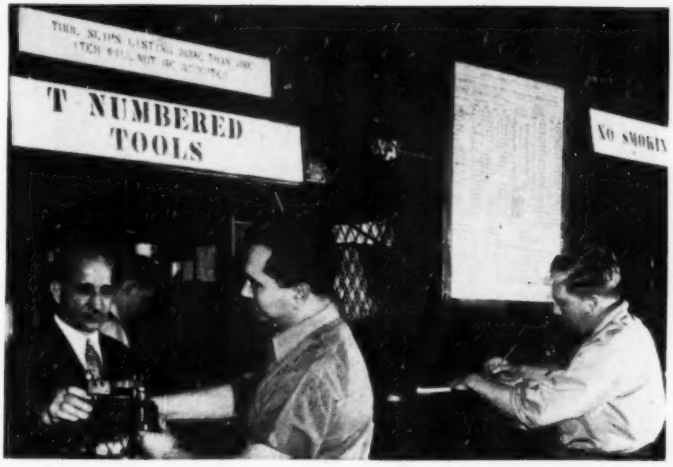
There is a place, however, for a 14-in. stool, and that is when we have to change the train of gears for screw cutting on an old-fashioned lathe. Most old-timers will agree with me that the five or ten minutes in that squatting position are eminently disagreeable.

E. Manuel Montero
Lima, Peru

•

TALK OR SWEAT FIRST

A new man in the shop is a stranger within the gates. No matter how aggressive a man may be, he is bound to be at least a little embarrassed when he enters a strange plant the first time. Under such circumstances, there have been men



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who have been tempted to run and leave the place rather than see new surroundings and new faces.

By all means, a foreman should have a discussion with a new man. It is true that record cards from the personnel department or the front office do help, but they do not give many details which a foreman may, himself, get from the man.

Only in this way can a foreman learn some facts about the past experience of the new man. A frank and honest talk allows the foreman a great advantage, for he will better know how to place the man to the advantage of the firm, of the foreman and of the man himself.

Now, while such a discussion may be entirely friendly, it is not necessary that the foreman give the man the impression that he is showing any preference. Neither is it a good idea for the foreman to inquire into the man's private affairs.

When in the position of an executive, I have instructed all foremen, not only to have such discussions with new men, but also to have new men introduced to the men whose work is in the same department and so allow an amiable meeting for all concerned.

Because of such an introduction, the new man will feel freer to ask questions of his neighbor workmen about the customs of the plant, for no two plants follow the same procedure and this will not take up the time of the foreman.

This is important, for, unless the new man inquires, he may not know where the toolroom is located; where any jigs and fixtures are kept or other things which he may have occasion to use.

Of course, there will be some men who always look upon a new man as an intruder, and show him little if any courtesy. These are, however, in the minority.

The modern plant has no place for men who have grouchy natures. In my opinion, Ed is entirely wrong.

F. H. Stebbins
Worcester, N. Y.

•

All people are more or less socially inclined. It's our nature. It leads to contentment and satisfaction, therefore, should be encouraged rather than discouraged.

However thorough an Employment Dept. may be in its work, it's only a fact-finding group which leaves the proper handling of those whom it employs to the department to which they are sent.

The various departments, as they receive the new employees, are en-

tirely responsible for seeing that all employees are treated in a way that will be both pleasant and profitable for all concerned. In entering a new shop, a stranger naturally looks for signs of friendship and encouragement.

Enough time should be spent with a new employee to show him around the shop, explaining the system and methods in use to enable a decision to be made as to the class of work in which he is best adapted.

It is with much satisfaction that I recall going into the shop where I had been engaged to work during my younger days. There was no one there of my acquaintance, but I was greeted in a friendly way almost as soon as I arrived by one who showed me where the things were located that I needed to know about. Then and there started a fellowship that grew steadily for upwards of 35 years, until his death.

Abel Blakeman
Watervliet, N. Y.

•

In dealing with the new man, I am rather inclined to lean toward Ed's viewpoint—leave the man alone until he has become used to his new surroundings and let the "confidential chat" come later when and if he feels like it.

I am assuming, of course, that the new employee has been greeted by Ed in a friendly manner and shown his duties and workplace, where to hang up his clothes, find tools, etc., and introduced to the men in his vicinity. I believe even the busiest foreman cannot afford to neglect this simple, basic approach to the new man's respect and confidence. Yet, in over three decades of shop experience I have found this to be the exception, rather than the rule. Too often the foreman is "too busy" to leave his office or finds some other excuse and delegates the responsibility to a shop clerk or other not-too-interested underling.

However, assuming that Ed is the intelligent type of foreman and has settled the new man in, I believe it is sound psychology to leave him to his own devices. Most men, myself included, dislike anyone hovering over them, even with the best intentions in the world. Let the new fellow concentrate on his work, once he has "found his feet" will be time enough to expect him to open up and have that "confidential chat" that Al talks about. Of course, it doesn't do to expect too much in the line of personal information from every man. A man who is naturally reticent often resents any attempt to

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New Towmotor Sound Movie, "The One-Man-Gang," is packed with materials handling ideas for management and operating groups of all factories, plants, warehouses and general operations interested in materials handling. Ask to see it in your office.

TOWMOTOR
THE ONE-MAN-GANG

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be quizzed about his politics, social habits, etc., even in the friendliest manner. Of course, at the other end of the scale is the fellow who is more than ready to divulge his family history and any other information a foreman is willing to listen to. This type of individual usually has an axe to grind.

To sum up, the wise foreman should start the new man off on a friendly basis and maintain that attitude without neglecting the fact that he is a representative of management charged with the responsibility of obtaining maximum production. Be fair, be friendly, but be firm.

Robert S. Alexander
Greenville, R. I.

•

THAT'S MY BABY!

No other person is in as close contact with the workman as the foreman and knows so well the personalities and capacities of the individuals.

It goes without saying that no other person is so well situated to know the various dispositions and qualifications and the individual treatment required to secure best results as well. The foreman knows best what shifts to make on various jobs to keep up production without sacrificing quality. Regimentation from a higher office in regard to lost time is disregarding all of the above principles.

If and when an excessive amount of lost time on the part of workmen is experienced, a general order from a top executive can well be issued to foremen to check the reasons and urge a study of the situation. This should be sufficient.

Written permission from the front office for time off probably would reduce absenteeism some at the time, but it would be at the expense of matters most important, and it would lower the foreman in the eyes of the workmen.

H. B. Martin
Watervliet, N. Y.

•

I feel that Al has a justifiable grievance in having his authority lessened regarding the matter of "time off" for his men, although this statement is made with a reservation.

We know that in many shops foremen have their "pets," who are usually indulged as much as possible. It is true that these favorites trade on this factor as regards time off, although generally the average worker is not inclined to absent himself

from his job for any little whim.

When a foreman uses discretion in granting leave of absence to an employee, he usually knows the circumstances, and is safe in giving permission.

Naturally, frequent leaves interfere with production, and the wise foreman would explain to his men when they ask too often for leave why such requests cannot always be granted, except in cases of urgency.

As a rule, only one or two workers request time off for reasons which may seem important to them, and if a particular job is not seriously retarded by their absence, the foreman would be justified in giving permission, without being called on the carpet for a dressing down.

Of course, the Top Boss feels that absenteeism slows production, and since the object of management is to assure continuous output, the Top Boss believes that such lost time should be reduced to a minimum. But I think that in relieving the foreman of this responsibility, the Big Boss is making a mistake.

The foreman knows more of the routine in his department, and with whom he can dispense for certain periods, than does the front office; but in cases when the foreman exceeds propriety in giving too many leaves of absence to the same group of workers, then it is time to effect a change in such authority.

Milton F. Sussman
Brooklyn 20, N. Y.

•

MEN ONLY?

Where the type of work is suitable for women, and the environment is uplifting enough for them to maintain feminine dignity, I feel that women should not be discriminated against. They're smart, possess perceptive shrewdness, and are careful. Their manipulative adeptness in operations in confined space, such as small assemblies, puts them in a superior class to their clumsy-fingered male competitors.

In all plants where women are employed there should be a strict supervisor, one of whose chief duties would be to maintain proper relations between the sexes. Her muscular development should be such as to permit her to use her swift-moving forearm in the event a "wise guy" injects his self-styled humor upon an innocent woman employee.

There are some jobs which a woman should not be permitted to do. Every time I pay a visit to a factory and see a beautiful woman (the term here is not used in ref-

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A32 Cylindrical Die THREAD ROLLER

This new Reed A32 Cylindrical Die Thread Roller with positive cam control of three cylindrical dies, produces uniform smooth precision threads on heat-treated steels at surprisingly high rates of production. Thread rolling is a cold-forging process that forms the thread by displacement of metal. This process increases fatigue strength and results in considerable saving of expensive materials.

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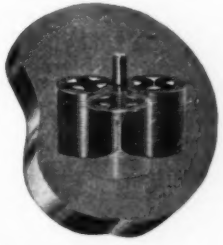

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AM III

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Illustrated is the popular Wells No. 8 Saw with wet cutting system.

use a WELLS METAL CUTTING BAND SAW!

In thousands of plants all over the world, Wells Saws are proving that it is possible to cut metal faster and more accurately at lower cost. This is accomplished through machine design and the principle of *continuous cutting*. As each tooth does its share of the work, the blade is cutting all the time — there is no lost motion. This means more cuts per day and lower unit cost to you.

Three standard models of Wells Metal Cutting Saws are available to meet virtually every need. Use the handy chart below to find the saw you need to meet your requirements and ask your Wells dealer for complete information or write direct.

DESIGN DETAILS

Saw No.	No. 5	No. 8	No. 12
Principle Use	General Utility	Utility and Production	Heavy Duty Service
Capacity, Rectangular	5" x 10"	8" x 16"	12" x 16"
Capacity, Rounds	5" dia.	8" dia.	12¾" dia.
Speeds, Selective	60, 90, 130 ft./min.	60, 90, 130 ft./min.	50, 90, 150 ft./min.
Power	⅓ H.P.	⅓ H.P.	⅓ H.P. & ¾ H.P.
Weight, Approx.	425 lbs.	665 lbs.	1750 lbs.

Wells Saws

Wells

Products by Wells are Practical

METAL CUTTING BAND SAWS

WELLS MANUFACTURING CORPORATION
505 ROOSEVELT ROAD, THREE RIVERS, MICH.

erence to any particular individual in skirts, but in a generic sense only) operating a punch press—dangerous at all times regardless of safety features, my chivalric blood comes to a resentful state of overheating.

I am particularly interested in seeing that women are placed in toolrooms. There the golden opportunity lies. The young lady's especial adaptness to delicate operations, as we find in gage making, light-tool grinding, and sundry other classifications, fits her in to her rightful place in a vital section of industry in which her value is materially enhanced in the event of national emergency.

Were I in my physical prime, I would delight in being employed in a well-ordered toolroom in which the flower of our hearts abounded in reasonable numbers throughout. Who knows; her elevating presence might be the means of the mike-slinging males enhancing their persons with cleaner aprons and numerous tonsorial resplendishments.

John Homewood
Ontario, Calif.

Manufacturers of machine tools and equipment have been increasingly active in making their products more convenient and easier to operate in recent years by substituting the driving power of the equipment for hand work by the operator, thus producing a more uniform and improved product with less exertion and fatigue on the part of the operator, all of which has encouraged the ladies to enter into shop work.

While women generally are not nearly as capable at machine-shop work as the average man, nevertheless quite a number of them are fully as apt in adapting themselves to existing conditions as are men. Thus, as time goes on, standard machine-shop practice becomes more and more favorable to be taken up by the ladies.

Yes, women have a place in metalworking production, and it is becoming more apparent. Working in plastics may be added to this list.

Women have a more sensitive feel than men, which makes them better adapted to many types of light work, especially in inspection.

Women through choice and circumstances are replacing men to a greater extent because they are preparing themselves better to meet life's struggles in practically all lines of work. Why should they not be allowed to make their own selection beyond those home and family duties

which they only have been ordained to do?

Due to the changed and improved conditions in the world today, giving all people a greater choice in occupations, there seems to be no plausible reason why both men and women should not as far as practicable choose the line of endeavor that will furnish them with the greatest satisfaction.

I can see no ill effects from the influx of ladies in the machine-shop—in fact the moral conduct seems to be improved by their presence.

John Mark May
Watervliet, N. Y.

"Quotes"

Conveyors Are the Artery of Production

SPEAKING at the Second Materials Handling Equipment Manufacturer's Conference, sponsored by Westinghouse Electric Corp. on Nov. 8-9 at Buffalo, C. L. Moon, sales engineer, Mechanical Handling Systems, Inc., emphasized that a close relationship exists between scientific management and conveyorization. In his words, "the conveyor system in its highest form of development is truly the artery of production.

"Through these veins flow, at predetermined speeds and at regular intervals, the raw materials and the component parts of the finished product,—the basic manufacturing operations in each case being broken down into relatively simple units of work so that the major skills have been greatly simplified. Operations are so timed and synchronized that an even, uninterrupted flow without bottle necks is achieved.

"The quality of work is greatly increased because individual responsibility has been lessened, and the functions and duties of each individual have been clearly defined—each worker having a definite job to do and a prescribed time in which to do it. This breakdown makes for easy control, both of the volume of production and also of the quality of the product.

"The function of proper inspection is greatly simplified because the work is broken down into simple units. In this way, faulty work can be discovered before any serious amount of harm is done. The *most important factor,* however, is the fact that the opportunity for doing poor work is greatly minimized by

A section of Unitcast's production molding line where one machine averages a mold every two minutes.

. . of Models and MOLDS

The skill and patience of craftsmen that execute miniatures often compares but never attains the degree of detail . . . comprehensive detail that is required of craftsmen who mold dependable steel castings.

For example, Unitcast's production molding system is based on coordination of details. Here, in the hub of the foundry, materials from sustaining departments meet prearranged schedules to initiate the form of fine steel Unitcastings.

It is difficult to visualize what comprehensive details are actually necessary to operate Unitcast's precision mass production! Briefly, advance planning must be thorough and, as jobs enter actual production, a daily re-check on schedules maintained. Continuous production of numerous types, shapes and sizes of Unitcastings requires that schedules be coordinated with supply lines and molding equipment capacities. Pattern equipment must be transposed properly and the entire battery of molding equipment must be kept operating efficiently.

Yet, it's all in the days work. With Unitcastings, like model making, painstaking time and patience have established long records of proven standards that assure Unitcast's customers the benefit of efficient casting proceedure. Take advantage of Unitcast's *proven* experience . . . for your next job specify Unitcastings!

Unitcast Corporation, Steel Casting Division, Toledo 9, O. *In Canada:* Canadian-Unitcast Steel, Ltd., Sherbrooke, Quebec.

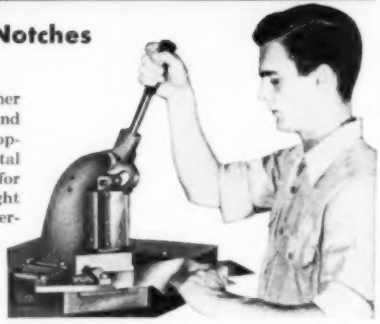
PRODUCTS LAST *LONGER* BUILT WITH *STRONGER* UNITCASTINGS

UNITCAST
Corporation
ELECTRIC STEEL CASTINGS

THE **di-acro NOTCHER**

Duplicates Precision Notches WITHOUT DIES!

The new precision DI-ACRO Notcher eliminates the need for punch press and dies on many production notching operations. It is also ideal for experimental work as it can be quickly adjusted for any size or shape notch. Many straight shearing operations can also be performed with this flexible unit.



CUTS CLEAN—NO BURRS OR ROUGH EDGES

The powerful DI-ACRO Notcher has an exclusive roller bearing cam design which provides a tremendous pressure with a small amount of effort. The precision-ground Vee-shaped ram and blades of alloy tool steel assure clean cuts and permanent accuracy.

LARGE CAPACITY. The DI-ACRO Notcher cuts 90° notches up to 6" by 6" in 16 gauge steel in one operation. Larger notches, and wider or narrower angles, can also be obtained.

SEND FOR 40-PAGE CATALOG. Gives full information on all six "DIE-LESS DUPLICATING" production boosters—DI-ACRO Benders, Brakes, Shears, Rod Parters, Punches, Notchers—with many examples of accurately duplicated parts.

DI-ACRO is pronounced "DIE-ACK-RO"

DI-ACRO PRODUCTION EXAMPLES

DI-ACRO DIE-LESS DUPLICATING MACHINES

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Strong and sturdy, 14 inches long, yet weighs only 17 ounces. Lock control for continuous welding. Cuts oxygen and acetylene costs one-third.

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Aluminum alloy construction... good balance, comfortable grip. Closed hand releases gas ... open hand cuts it off. Reduces idle flame fire hazard. Works perfectly with natural gas, manufactured gas, butane and compressed air.

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the reduced skill requirement of the operation.

"The fact that everything travels over a predetermined route means that an accumulation of parts or banks of material stored on the floor or in containers is entirely eliminated. This not only makes a tremendous improvement in general housekeeping but it makes a substantial reduction in work-in-process inventory.

"All of these factors add materially to cost reduction and overall manufacturing efficiency without reducing the earnings of workers. As a matter of fact, many of the most modern plants have, at this time, the lowest unit labor cost coupled with the highest individual worker earnings. This, of course, is a very desirable condition from every standpoint.

"While the original incentive for conveyor installations was reduction in payroll, the process of evolution thru which this science has passed during its period of recent development has added to it, countless other benefits, both tangible and intangible which appear to be of even greater importance than that which was attached to the original objective.

Oil Vapor Coolant

OLDSMOBILE has many holes to tap in cast iron in making the new Kettering engine. Increased tap life and better-quality threads result when oil vapor is blown over the tap in operation. What's more, the blast blows off clinging chips . . . solving a problem on machines where flooding is impractical, as on transfer units where chips are shed through the machine base to an underfloor chip conveyor.

NEW BOOKS

METALS HANDBOOK, *1948* EDITION—*Edited by Taylor Lyman, Published by The American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio. 1444 pages, 8x10 in. Price $15.*

Production men who are used to the 1939 Metals Handbook will scarcely recognize the new edition. Not only has more than two-thirds of the previous edition been rewritten and much new material added, but there have been basic changes in the format.

These changes are all to the good.

CROSS UNIVERSAL GEAR MACHINES

for

- ROUNDING
- CHAMFERING
- POINTING
- BURRING

Cross Universal Gear Machines embody advanced engineering developments to obtain highest productivity and assure lowest possible operating costs.

They feature utmost flexibility for handling a wide variety of gears. Continuous cutting motion, exclusive with Cross, speeds production at top efficiency.

Special skill is not required because machines are automatic and push button controlled. Power clamping is foot pedal controlled. Both hands are free for work handling.

No. 55

For rounding, pointing, chamfering or burring external and internal:

spur gears
helical gears
clutches
splines

Typical productivity when rounding or pointing 8 pitch 30 tooth gears is 55 net hourly.

No. 65

For pointing or chamfering external and internal:

clutches
spur gears
bevel gears
splines

Typical productivity when pointing 10 pitch 30 tooth gears is 100 net hourly.

No. 75

For burring or chamfering both ends at the same time.

helical gears
spiral bevel pinions
hypoid pinions

Typical productivity when chamfering 8 pitch 40 tooth gears is 200 net hourly.

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Established 1898
SPECIAL MACHINE TOOLS
MILLING • DRILLING • TAPPING • BORING
TURNING • SHAPING • GRINDING • HONING
DETROIT 7, MICHIGAN

The classification of material is intelligent and the indexes set an example that all other handbooks would do well to follow. Altogether there are seven indexes, guides, and tables of contents. Two of these are found by opening the front and back covers—a most practical arrangement. The major index (on paper of a distinctive color) is 64 pages in length, which indicates the thoroughness with which it has been prepared.

There is a 4-page folder supplied with the book containing suggestions for finding the material desired. The major complaint with the 1939 edition was the difficulty of locating anything. This complaint has obviously been taken to heart in preparing the new edition. The articles are the work of 68 subcommittees. Those familiar with the years of preparation which these committees put into their articles will know how carefully they have done their work. The men making up these committees are specialists in their respective fields and hence have written with authority.

The only objection that this reviewer has is that the very completeness of the new edition makes it bulky to the point of inconvenience The handbook almost deserves a stand of its own, like that used for unabridged dictionaries. However, this inconvenience is a small price to pay for the improvements included in this edition of the Metals Handbook.

•

COMBUSTION ENGINES—*By Arthur P. Fraas, associate in motors, Aeronautical Institute of Technology of Brazil. 439 pages, 6x9 in., plus a set of five charts. 245 illustrations. Published by the McGraw-Hill Book Company, 330 West 42nd St., New York 18, N. Y. Price $5.50*

Theory and practical problems are related in this text, fundamental relationships being developed from elementary theory, then related to engineering methods. Concerned primarily with piston-type engines, the book covers the more important thermal and mechanical problems of gas turbines. Automotive engines take up most of the author's space, but he also covers other types from those for lawnmowers to those for locomotives, ships and stationary plants.

Included are five charts for products of combustion of octane and air—one for each of five representative fuel-air ratios. Twenty other charts and tables are included.

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In the preparation of automotive, diesel and industrial oils of enhanced lubricity and detergency.

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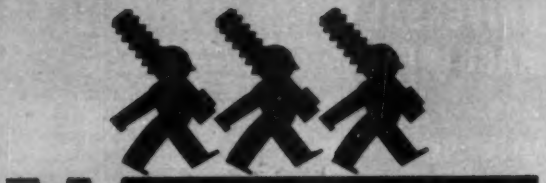
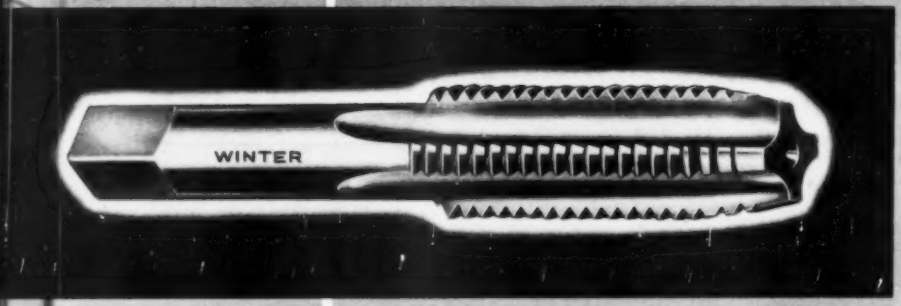


WINTER

TAPS IN ACTION



In hundreds of plants throughout the country, WINTER HAND TAPS are producing accurate tapped holes and saving their users money.

Three styles are available, individually or in sets: taper style, plug style, and bottoming style.

WINTER standard hand taps are supplied with cut thread in carbon or high speed steel, and with commercial ground or precision ground thread in high speed steel.

In addition, WINTER offers a complete line of taps and dies, including chip driver, machine screw, nut, pipe, pulley, stove bolt, and tapper taps.

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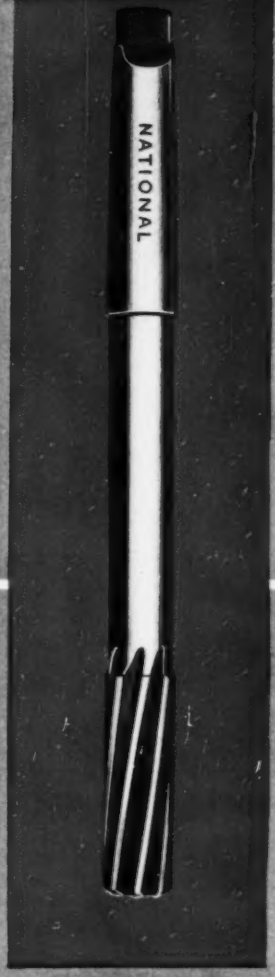

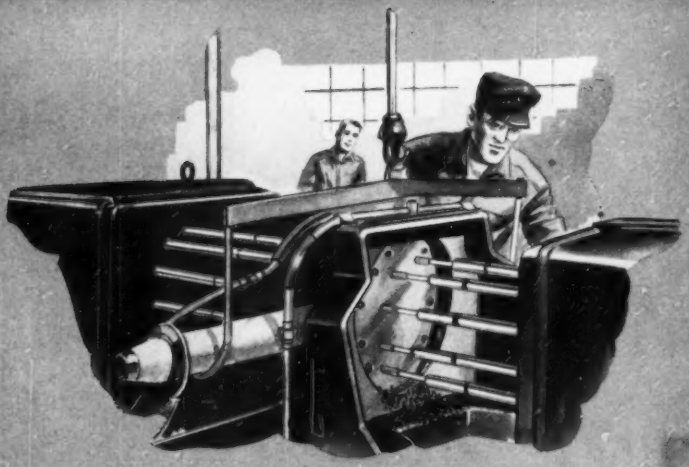

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Where holes must be finished to size with minimum chatter, NATIONAL SPIRAL FLUTED CHUCKING REAMERS have proven themselves on the job. They maintain their size because of special design and heat treatment. Besides spiral fluted chucking reamers, NATIONAL offers hand, straight flute chucking, shell, taper pin, center, and special reamers. NATIONAL also manufactures a complete line of rotary metal cutting tools, including twist drills, milling cutters, counterbores, end mills, hobs, and special tools.

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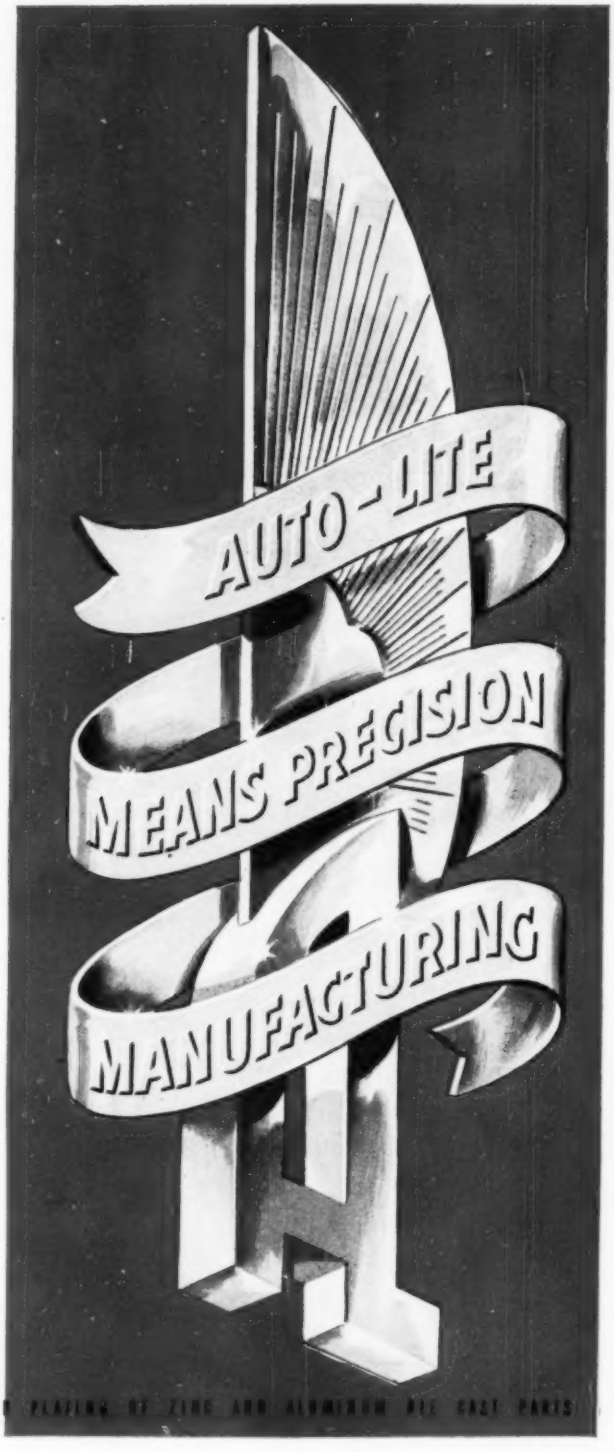

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New Catalogs, Booklets, Bulletins

MACHINES AND ATTACHMENTS

1 GRINDERS—Vonnegut Moulder Corp., Indianapolis, Ind. 8-page folder describes Manchke grinders, both floor and bench type, and buffers. Horsepower ratings range from from 1 to 25. Swing frame grinders are included in the descriptions.

2 VERTICAL INDEXING MACHINES—Davis and Thompson Co., Milwaukee, Wis. 4-page bulletin 160 illustrates machine for drilling, reaming, milling, boring, chamfering, back chamfering, sawing, recessing and tapping operations. Also illustrated are Roto-Matic drilling and milling machines.

3 DIE-CASTING MACHINES — The Hydraulic Press Mfg. Co., Mount Gilead, Ohio. 6-page bulletin 4003 discusses hydraulic die-casting and illustrates specific die-casting jobs. H-P-M submerged-plunger and cold-chamber machines are described.

4 JIG GRINDER—Boneham and Turner Ltd., Mansfield, Notts., England. 20-page booklet describes grinding head that slips into the spindle of any jig borer for grinding bores from 1/32 in. to 3½ in. diameter.

5 TUBE MILLS—The Yoder Co., Cleveland, Ohio. 36-page book describes and illustrates tube-mill operations, the types of products produced, production problems, and the mills themselves. Data includes electrode requirements, welding speeds, power consumption, shipping weights and control setups.

6 GRINDERS AND POLISHERS — Standard Electrical Tool Co., Cincinnati, Ohio. 44-page catalog No. 44 describes grinders, buffers, polishers and speed lathes; illustrations and specifications are included.

7 BAND SAWS—The DoAll Co., Des Plaines, Ill. 8-page catalog presents photos and specifications in tabular form for 13 high-speed band sawing machines. Models range in size from 16- to 60-in. throat dimension. Friction-cutting hardened-steel coil springs are illustrated.

8 DRILLERS AND TAPPERS—National Automatic Tool Co., Richmond, Ind. 20-page bulletin 648 illustrates Holesteel models with a discussion of construction details, sample parts that can be produced and includes data on spindles, speeds and floor plans.

9 KEYSEATING MILLER — National Machine Tool Co., Cincinnati, Ohio. 20-page catalog No. 16 illustrates and describes keyseating and oil-grooving millers. Operating instructions include information on eccentric bushings, taper shanks, speeds and feeds, and special millers.

10 PRESSES—F. J. Stokes Machine Co., Philadelphia, Pa. 20-page catalog No. 478 depicts semi-automatic molding presses and other equipment for plastics molding. Transfer presses, toggle semi-automatic compression presses and pre-forming presses are also described.

11 LATHES—South Bend Lathe Works, South Bend, Indiana. 16-page catalog 22, describes toolroom and bench lathes, turret lathes, drill press and bench shaper; descriptions of attachments such as chucks, collets, milling and keyway cutters, tool blocks and taper attachments are included. Four-page catalog 73 describes 13- and 14½-in. precision lathes and accessories.

12 MILLING MACHINES—Atlas Press Co., Kalamazoo, Mich. 12-page catalog M-48 illustrates bench type and full size millers with construction details and attachments. Separate 12-page booklet gives examples of production set-ups with lathes, mills and drills.

13 TAPPING MACHINES—Procunier Safety Chuck Co., Chicago, Ill. Three, 4-page folders describe Series D machines, Series A machines for smaller work, and the two-grip tap holder.

TOOLS AND ACCESSORIES

14 INSTRUMENTS—Taylor Instrument Companies, Rochester, N. Y. Bulletin touches complete line of instruments separated by type of measurement or control, such as temperature, humidity, pressure, flow, etc.

15 FLEXIBLE SHAFTING — Elliott Mfg. Co., Binghamton, N. Y. 16-page catalog 49 illustrates and describes flexible-shaft machines for general purpose; floor stand, bench and suspended types, as well as machines for chipping, cleaning, agitating, grinding, buffing and burring are described.

16 DIAMOND WHEELS — United States Diamond Wheel Co., Aurora, Ill. 4-page folder contains diagrams and data for popular wheel sizes and shapes with pressures included.

17 GRINDING WHEELS — Simonds Abrasive Co., Philadelphia, Pa. 8-page bulletin ESA 55 contains wheel recommendations for centerless grinding, including a list of parts with the specified grinding wheels.

18 LUBRICATION EQUIPMENT — Alemite Div., Stewart-Warner Corp., Chicago, Ill. 48-page catalog presents complete line of industrial lubrication equipment including a barrel-to-bearing selection guide. Equipment illustrated includes hand guns, bucket pumps, portable power guns, hoses, couplings and fittings, and many accessories.

19 DRILLS—Whitman & Barnes, Detroit, Mich. 28-page bound book in commemoration of 100th anniversary presents a brief account of the highlights of the company's history. Along with a running account of the concern's growth, there are a number of drawings of the development of tools and the methods of making tools.

20 AIR TOOLS—Buckeye Tools Corp., Dayton, Ohio. 40-page booklet describes and illustrates grinders, buffers, drills, screwdrivers and nut runners, angle wrenches, shears and sanders—all operated by air. Specification tables are included.

21 HOLDING ASSEMBLIES—Metallurgy Div., General Electric Co., Pittsfield, Mass. Ten pages of data sheets contain information on holding devices, including magnets for use with indicators and for other applications.

22 MAGNETIC GAGES — Pratt and Whitney Div., Niles-Bement-Pond Co., West Hartford, Conn. 8-page booklet describes operation of magnetic continuous gages and illustrates equipment needed. Gages are used on rolling mills, shearing lines, receiving, inspection, and final inspection lines for checking material thicknesses.

Example

Name John Roderick
Title Supt.
Company W. C. Dorl Mfg. Co.
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HEAT-TREATING AND WELDING

23 ELECTRIC FURNACES — C. I. Hayes, Inc., Providence, R. I. 32-page catalog 110 features heat-treating furnaces, atmosphere generators, and furnace atmosphere charts. Atmosphere requirements for high-speed steel taken from typical installations is included.

24 INDUCTION HEATING — Tocco Div., the Ohio Crankshaft Co., Cleveland, Ohio. 40-page catalog No. 22 describes principles of induction heating, typical results of induction hardening and heat-treating, results of induction heating for forming and forging, and results of induction annealing.

25 HEAT-TREATING — Leeds and Northrup Co., Philadelphia, Pa. 32-page catalog TB2-621 describes furnace equipment which can be used for carburizing and gas cyaniding small loads, as well as hardening. Triple control methods regulate atmosphere, rate of heating and quench point. Simple accessories for gas cyaniding are described, and typical furnace installations are shown.

PLANT SERVICE EQUIPMENT

26 MOTORS — Brown - Brockmeyer Motors, Dayton, Ohio. Six-page bulletin 5000 illustrates and describes complete line of standard and several special motors.

27 SPEED REDUCERS — Cleveland Worm and Gear Co., Cleveland, Ohio. 8-page booklet illustrates fan-cooled "Speedaire" unit with several case histories of typical installations.

28 MECHANICAL DRIVE UNITS — Reeves Pulley Co., Columbus, Ind. 16-page bulletin GN-487 discusses the functions of automatic production control and the means of applying it to production machinery. The booklet describes hydraulic automatic control, mechanical automatic control and differential automatic control as well as various speed-indicating mechanisms.

29 RAM TRUCK—Yale & Towne Mfg. Co., Philadelphia, Pa. 12-page bulletin 2412 presents graphs, charts, line drawings, photographs and exploded views of 35,000-lb.-capacity ram trucks. Principal use of the truck is in handling coils of strip steel in a mill where it can transport and store the material.

30 STORAGE RACKS — Barrett-Cravens Co., Chicago, Ill. 16-page bulletin 4873 illustrates the use of barrel racks and improvements made with the racks and describes features of the product.

31 CONTROL DEVICES — Allis-Chalmers Mfg. Co., Milwaukee, Wis. 16-page bulletin 25B7093 describes and illustrates rotary control switches, pushbutton stations, generator voltage regulators, synchro-operators, current and potential transformers, oil and air circuit breakers, disconnect switches, oil immersed contactors, d-c relays and contactors, thermal relays, d-c remote positioning devices, indicating lamps, resistors, and terminal boards.

32 MATERIALS HANDLING EQUIPMENT—Palmer-Shile Co., Detroit, Mich. 30-page catalog illustrates hand trucks, rack trucks, barrel trucks, booms, pallets, racks, skids, boxes and other small materials-handling equipment.

33 PUMPS—Worthington Pump & Machinery Corp., Harrison, N. J. 12-page Bulletin W-319-B1C describes centrifugal boiler feed pumps. Illustrations show various stages of assembly, complete installation and diffuser parts.

34 FINISHING EQUIPMENT—Almco Div., Queen Stove Works, Inc., Albert Lea, Minn. 8-sheet folder describes and illustrates Superaheen deburring and finishing barrels, hopper and cam models, and self-dumping hoist unit.

35 CONVEYORS—Link-Belt Co., Chicago, Ill. 28-page booklet 2330 contains 90 illustrations of trolley-conveyor installations. A variety of specially made product hangers are also illustrated. Some trolley conveyors are electrified with bus bars along conveyor track to provide current for continuous testing of products.

36 SPEED REDUCER—Lombard Governor Corp., Ashland, Mass. Four-page folder depicts variable-speed transmission with illustrations, text and a power transmission graph. Characteristics of the reducer units are tabulated.

PARTS AND MATERIALS

37 STEEL—W. J. Holliday & Co., Inc., Chicago, Ill. 253-page stock list in catalog form tabulates regularly carried stock in rails, plates, rounds, squares, flats and many other forms. Also in stock are grinding wheels, drills, reamers, cutters, taps, saws, files, welders, hoists and chain.

38 DROP FORGINGS—The Steel Improvement & Forge Co., Cleveland, Ohio. 44-page catalog describes types and characteristics of forgings and discusses considerations in designing for forgings. Tables present information on forging metals and forging processes are illustrated.

39 FASTENERS — Bostitch, Westerly, R. I. 16-page booklet illustrates time- and money-saving case histories of Bostitch fastening jobs.

40 DIE CASTINGS—Light Metal Die Cast, Inc., Jackson, Mich. 12-page booklet discusses correct design, machining and finishing, and engineering features of aluminum and magnesium die castings. Properties of the materials are tabulated and examples of die-cast products are illustrated.

41 TAPE—Top Flight Tape Co., York, Pa. 8-page bulletin illustrates use of printed cellophane and acetate tape for safety messages, identification and labeling purposes. Tape is printed to specifications.

42 DIE CASTINGS — Lebanon Steel Foundry, Lebanon, Pa. 12-page booklet depicts process of centrifugal casting in permanent molds and contains data for executives, engineers and designers. Advantages, various methods now employed, new developments and applications of the process are described.

43 ALUMINUM — Reynolds Metals Co., Louisville, Ky. Portfolio contains 125 data sheets with drawings, dimensions and general information on extruded aluminum architectural shapes. Styles include thresholds, sills, hand rails, molding, coping and stops.

44 FLOW CHARTS—Miller Motor Co., Chicago, Ill. Air and hydraulic pressure and flow charts give information on cylinder stroke pressures, oil and air consumption, friction losses, piston rod strengths, and pipe sizes.

45 STEEL BARS—Republic Steel Corp., Cleveland, Ohio. 12-page booklet presents data on Union drawn steel bars for carburizing, including carbon steels, alloy steels, and field service.

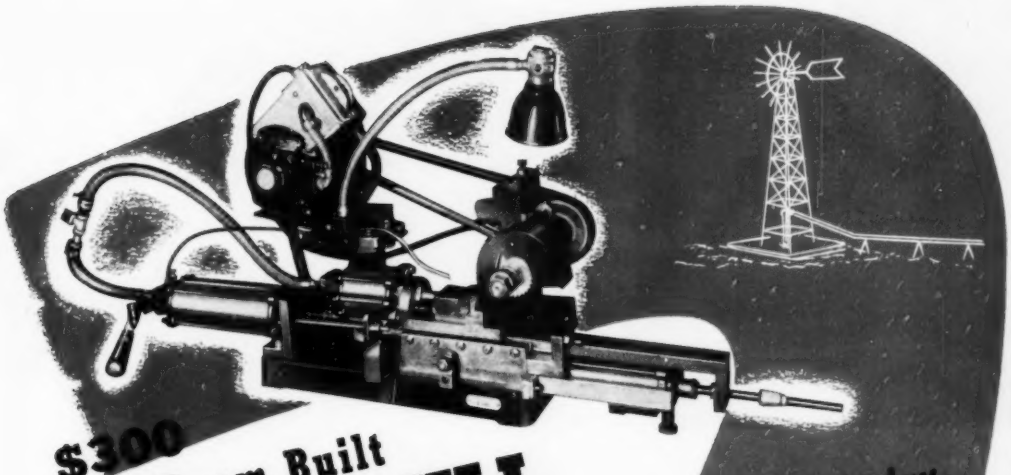
46 BALL BEARINGS — Norma-Hoffmann Bearings Corp., Stamford, Conn. 24-page booklet describes applications of cartridge ball bearings, dimensional data, load rating, dirt protection, grease type content and retention and presents drawings of bearings as well as tabulated specification data.

47 DIE CASTINGS—The New Jersey Zinc Co., New York, N. Y. 64-page booklet illustrates applications of zinc die-castings with photographs and text descriptions.

48 LEATHER—Chicago Rawhide Mfg. Co., Chicago, Ill. 32-page booklet depicts packings, washers, gaskets, belting, gears and pinions, and hammers.

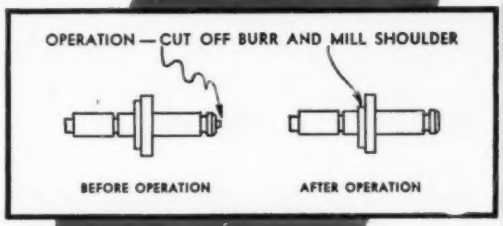
49 AIR CYLINDERS — Gerotor May Corp., Baltimore, Md. 16-page catalog 53 illustrates and describes entire Gerotor line of air cylinders with drawings, dimensions and tables.

50 SOLENOID VALVES—Hannu Engineering Works, Chicago, Ill. 4-page folder contains specifications on solenoid valves for manual, semi-automatic and automatic control.



$300 Tool Room Built "WIND" MILL

Jumps Production on Dial Shaft to 7600 per day



THE production run on this dial shaft was not sufficiently large to warrant automatic machines. Yet, the cost of deburring the end and milling the shoulder in two separate hand operations was too high to suit Rodney Opp, factory manager of Ranco, Inc.

Ranco's tool room went to work. Under the direction of Charles Calland, process engineer, they designed and built the small, special purpose machine shown above. Operated by two Bellows Air Motors, this inexpensive unit, nicknamed the "windmill," jumped production to better than 900 per hour — held operator fatigue to a minimum — reduced part cost by 31%.

Bellows "Controlled-Air" Powered Devices are providing a helpful answer to cost-conscious production men looking for inexpensive ways to increase output — quickly.

"Controlled-Air" Power, intelligently applied, can eliminate costly repetitive manual operations, often permits grouping multiple operations on a single machine; makes possible short run production at a cost reasonably comparable to long runs on expensive factory-built special purpose machines.

The operation pictured above is fully described in Foto Facts File FF47-742. We will be happy to send you a copy, together with the interesting new booklet "'Controlled-Air' Power for Lower Production Costs," without cost or obligation. Address The Bellows Co., Temple Square, Akron, Ohio.

The Bellows Co.

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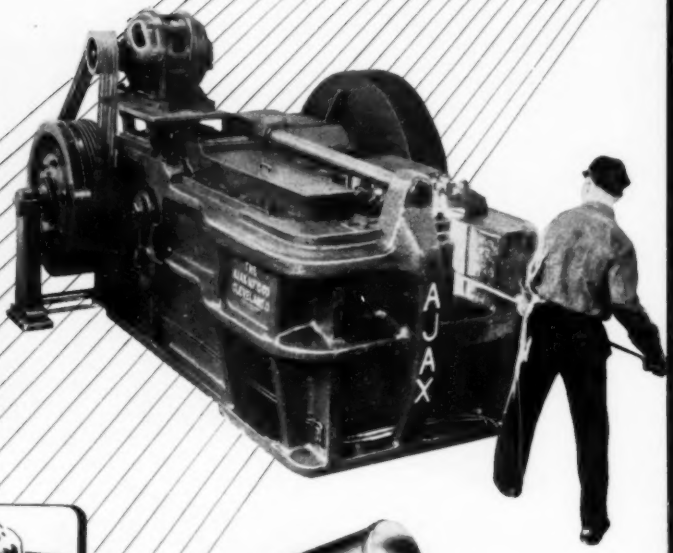
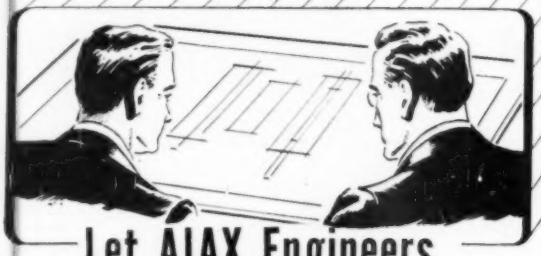
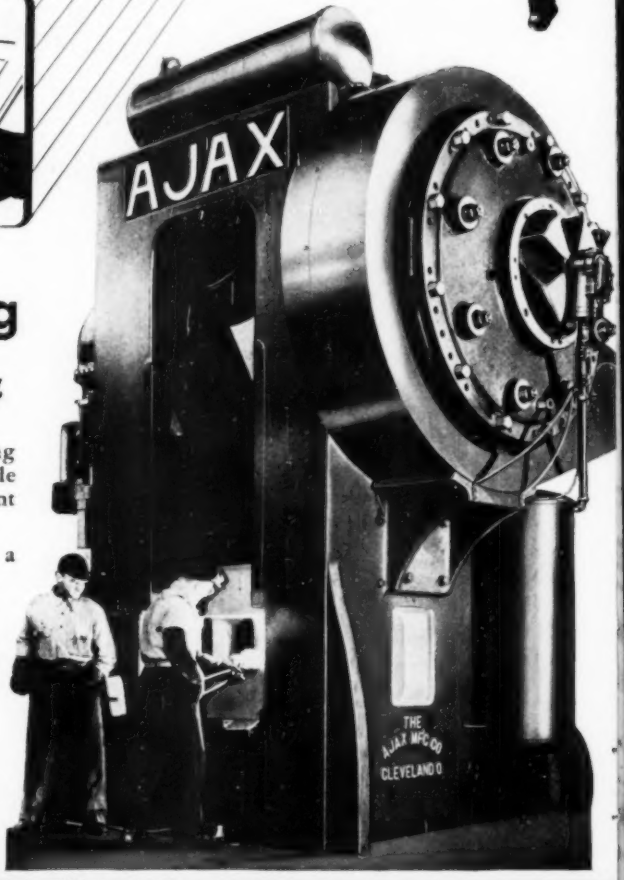




Let AJAX Engineers

Aid You In Selecting

Forging Machinery



Ajax engineers, thoroughly experienced in forging processes and forging machinery, can be of valuable assistance to the persons responsible for efficient forging production.

The Ajax Manufacturing Company manufactures a complete line of forging machinery - - - Forging Machines, Forging Presses, Forging Rolls etc. Ajax engineers, with the knowledge gained through research and development within their plant and through constant contact with the most progressive forge plants in the country, are experts in the field of forging. Whether your problem concerns the selection of one piece of forging machinery for the forging of a single part, or a multiple unit production line set-up from bar stock to the trimmed forging, Ajax engineers will welcome the opportunity to assist you wherever possible.

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NEW LONDON, CONN.

PRODUCTION EXPERTS

UTILIZE BAUSH MULTI-SPINDLE MACHINE TOOLS FOR HIGH QUALITY—HIGH SPEED AUTOMOTIVE PRODUCTION

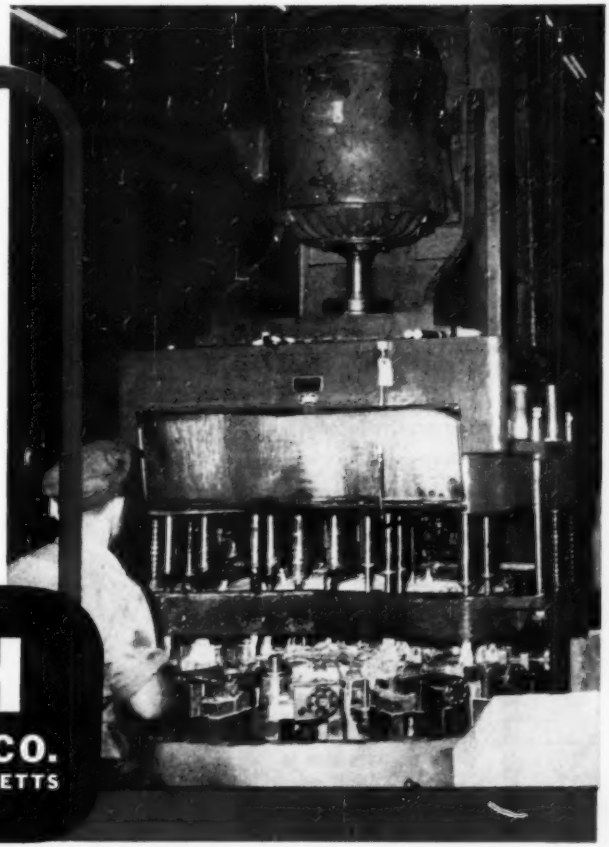
For many years leading automobile manufacturers have used Baush Machine Tools to speed production and *lower costs.*

Baush Units — whether in a completely automatic transfer set-up, or as a manually-controlled semi-automatic single purpose machine — meet every requirement of the automotive industry.

Baush Multi-Spindle Machines are designed for heavy duty and high speed for the complete machining of all holes in cylinder blocks, heads, housings and component parts.

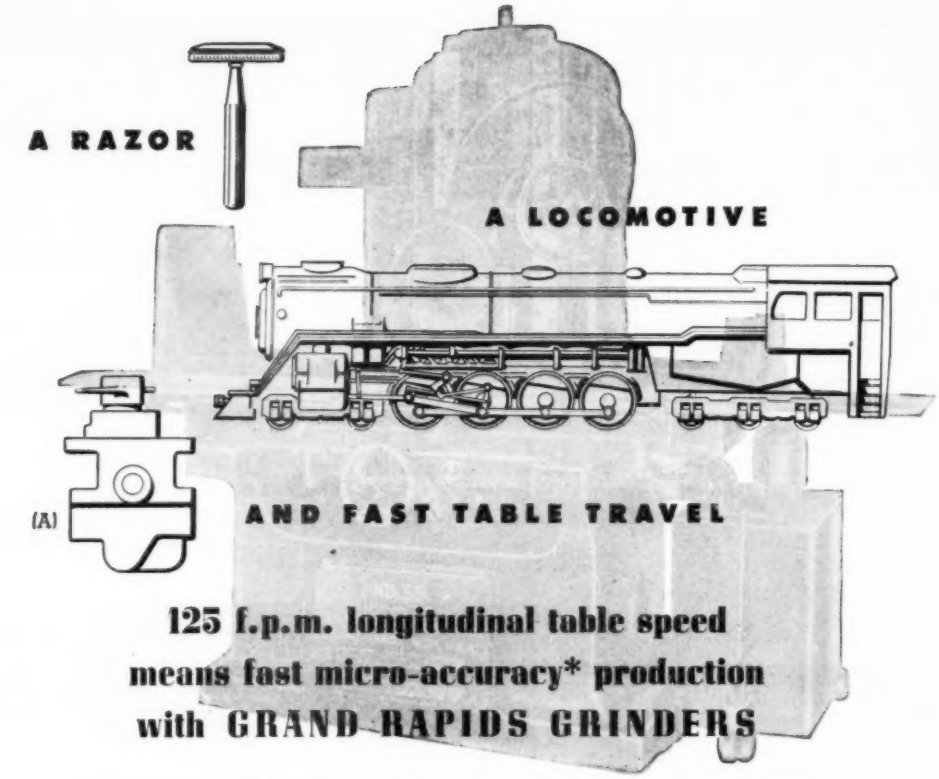
Send us your production problems — our engineers will gladly help solve them.

Baush W-Type Heavy Duty Hydraulic Multiple-Spindle Drilling and Reaming Machine at Kaiser-Frazer Willow Run Plant.



Utilizing a 16-spindle fixed center head, this unit drills and reams SAE 8640 forged steering knuckle supports. Specifications: 29/32" drills and 1-3/32" drill fed at .004" per revolution with reamers hydraulically fed at .0016" per revolution. Output 120 pieces per hour.

BAUSH
MACHINE TOOL CO.
SPRINGFIELD 7, MASSACHUSETTS



125 f.p.m. longitudinal table speed means fast micro-accuracy* production with GRAND RAPIDS GRINDERS

Fast longitudinal table travel — *the fastest available in any grinder* — is an important reason why you find Grand Rapids Grinders in so many leading plants. Such rapid operation makes possible high-speed, accurate production . . . of small mass-produced razor parts, as well as massive locomotive sub-assemblies. This high-speed table travel is achieved by a specially designed control valve (A) and vane type hydraulic pump. The special control valve changes the flow direction of the hydraulic fluid to rapidly reverse the table travel. The pump is operated by a separate motor, which is entirely independent of the spindle drive. And you get these other assurances of long-life speed and accuracy in Grand Rapids Grinders: vibrationless rigidity achieved by massive one-piece column and base casting; patented vertical head adjustment; flanged-type, preloaded ball bearing spindle; powered vertical travel of wheel head; and Bijur, one-shot lubricating system.

*Accuracy within 0.00025 limits

TO SERVE YOU — *Your inquiry concerning your specific grinding needs will receive prompt attention. Grand Rapids Grinders include: Hydraulic Feed Surface Grinders, Universal Cutter Grinders, Hand Feed Surface Grinders, and Combination Tap and Drill Grinders.*

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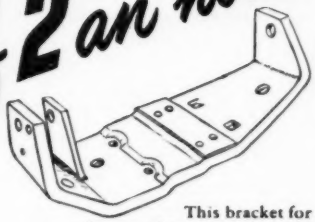
330 Straight Ave., S. W., Grand Rapids 4, Mich.

GRAND RAPIDS GRINDERS

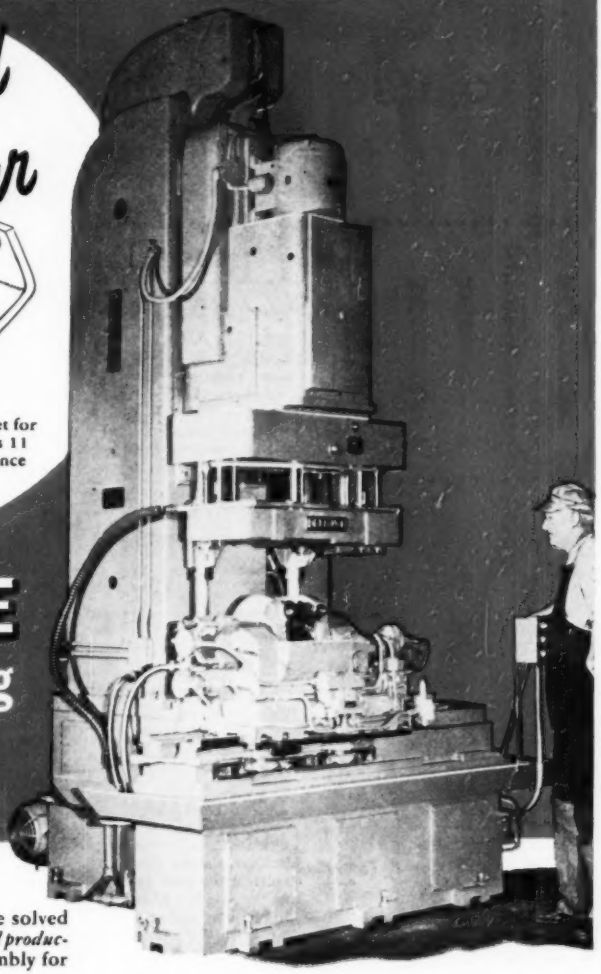
26 instead of 2 an hour



This bracket for farm machinery requires 11 holes drilled - and Defiance does it in 2¼ minutes!

with

DEFIANCE
Production Drilling Machine



Here's how a DEFIANCE Machine solved a drilling problem—with *greatly increased production*—drilling 11 holes in a bracket assembly for a large farm machinery manufacturer.

Ordinary methods would have required 6 changes of drills, plus a cumbersome fixture for drilling on 4 different surfaces. Estimated production—one part every 30 minutes. Then Defiance designed and built the special 11 spindle vertical drilling machine shown here, which does the job in 2¼ minutes—26 parts an hour at full production!

The operator loads the part, presses a button and the fixture automatically indexes radially and longitudinally in four positions. In 2 minutes and 3 seconds, the performance-proved Defiance No. 37 Unit Head accurately drills the required holes. Fixture then stops for operator to remove finished part and re-load for next cycle. For safety, interlocking controls prevent drill unit from coming down unless fixture is in position both radially and longitudinally. For setting up, manual controls allow fixture to be moved to any position of cycle.

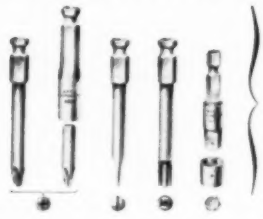
If you are interested in improved quality, high production, and reduced costs—bring your production boring, milling, drilling and tapping problems to Defiance. Write . . . Defiance Machine Works, Inc., 2325 Madison Ave., Toledo 2, Ohio.

99 YEARS OF PRECISION MANUFACTURE

DEFIANCE

BORING — MILLING — DRILLING — TAPPING MACHINES

4 reasons why it pays to use APEX



1. BITS—For Phillips, Frearson, Clutch Head, Slotted, Socket or Hex Head Screws

Hand drivers for Phillips, Frearson and Clutch Head Screws. Bits for practically every make of power driver.

Apex bit holders do a big job with a minimum inventory. Just obtain the bit holders you need (they last indefinitely), then order tips (of whatever type you need), discard the worn tips and insert new ones.

On hexagon head screws each replaceable, long wearing socket has two lives. Use one end till it is worn, then turn end for end and you have a new socket.

Write for Catalog No. 20-A.

2. SOCKETS

Plain Sockets, female square drive, ¼" thru 1".

Adapters, hex drive with male square, ¼" thru ⅝".

Adapters, male and female square drive, ¼" thru 1", short and long.

Straight Wrenches, hex drive, ¼" thru ⅝".

Straight Wrenches, square drive, ⅜" thru ¾".

Allen Drivers, female square drive, ⅜", ½" and ¾".

Universal Sockets, female square drive, ¼" thru 1".

Universal Adapters, male and female square drive, ¼" thru 1".

Universal Wrenches, hex drive, ¼" thru ⅝".

Universal Wrenches, female square drive, ⅜" thru ¾".

You will find the right tool for practically any requirement from the Apex standard line. Catalog No. 19 gives full data and prices. We quote promptly on specials.

3. Adjustable STUD SETTERS

The remarkably small O. D. on Apex Stud Setters enables them to get into hard-to-reach spots with ease and precision—even in the hands of unskilled workers. Their ruggedness makes them desirable tools for either hand or power operation. They are easy to adjust, and once set for desired length of thread on stud, they *stay adjusted*. Four sizes cover a range of studs up to 1¼". You can have Morse Taper shanks, hexagon, T-Handle, square female or T-Handle combination with a square female drive for use with a torque wrench. Types to fit any make of power tool. Write for Bulletin No. 101-B.

4. UNIVERSAL JOINTS (Heavy Duty) For Aircraft and Industry

Standard sizes from ⅜" to 4".

In addition to high strength-weight ratio (axial and torsional) the unique structural design of Apex Universal Joints assures low deflection rate, long wear, superior fatigue resistance and overload capacity and long life, thus opening many other applications.

Apex Joints are sealed hermetically with flexible covers that keep lubricant *in* and trouble *out* and permit the joints to be used in corrosive or abrasive laden atmospheres or liquids, at extremes of temperature.

For complete information write for Catalog No. 103-A.

Catalogs will be sent only upon requests written on company letterheads

The Apex Machine & Tool Company, 1030 S. Patterson Blvd., Dayton 2, Ohio

Safety Friction Tapping Chucks • Quick Change and Positive Drive Drill Chucks • Vertical Float Tapping Chucks • Parallel Floating Tool Holders • Power Bits for Phillips, Slotted Head, Frearson and Clutch Head Screws • Hand Drivers for Phillips, Frearson and Clutch Head Screws • Aircraft and Industrial Universal Joints • Sockets and Universal Joint Socket Wrenches

NEW!

Power Gaging of Threads

Here, at last, is a power-driven gaging handle which substantially reduces inspection time and operator fatigue on internally threaded parts.

Specially designed for faster inspection, this new Taft-Peirce power-driven gaging handle completely eliminates manual rotation of the gage . . . screwing it into the work mechanically at *four revolutions per second.* A slight change in the applied pressure causes *immediate reversal or automatic disengagement* of the drive.

If you want to raise your output and cut inspection costs on threaded parts, write us today for full information or 'phone your local Taft-Peirce representative.

THE TAFT-PEIRCE MANUFACTURING COMPANY, WOONSOCKET, R. I.

AVAILABLE FOR THE FOLLOWING A.G.D. GAGE BLANKS	
SIZE (Numbered according to equivalent A.G.D. handle)	FOR A.G.D. GAGE BLANK NO.
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SPECIFY HANDLE SIZE DESIRED
110 VOLTS A.C. ONLY

T-P *means* Top Precision

INCREASED PRODUCTIVITY

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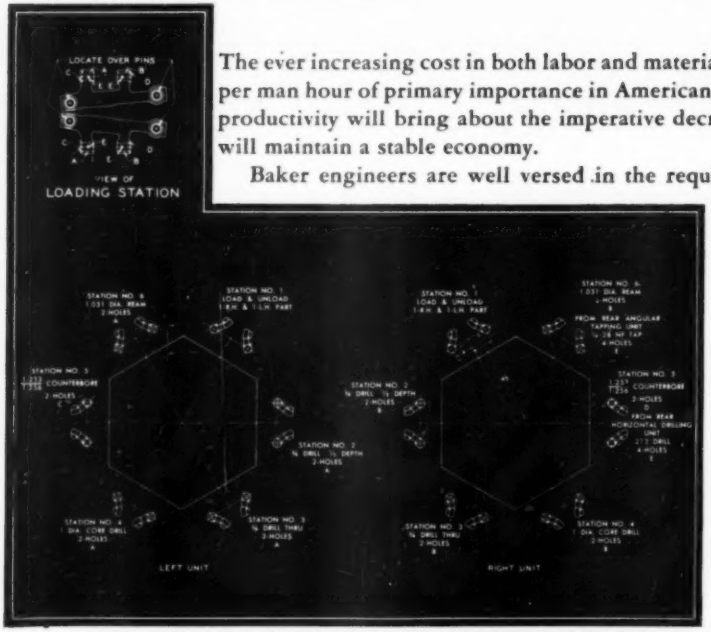
BAKER PRODUCTION MACHINES

Baker multi-operation machine does drilling, boring, reaming, counterboring and tapping operations on automobile front wheel spindle supports.



The ever increasing cost in both labor and materials makes greater productivity per man hour of primary importance in American industry today. Only greater productivity will bring about the imperative decrease in production cost that will maintain a stable economy.

Baker engineers are well versed in the requirements of today's industry. Every Baker special machine is designed specifically for utmost productivity, minimization of wear and work handling, and consolidation of operations to allow lower operating cost of machinery. For all requirements in drilling, boring, tapping and reaming machinery consult Baker engineers for the key to Increased Productivity as applied to your specific problem.

BAKER BROTHERS—Inc. TOLEDO OHIO

DRILLING, TAPPING, KEYSEATING AND CONTOUR GRINDING MACHINES

ONE ROTARY ELECTRIC IMPACTOOL DOES THEM ALL

NOW AVAILABLE IN 2 SIZES

THE GREATEST
LABOR-AIDING, TIME-SAVING ELECTRIC TOOL EVER OFFERED

SAVES UP TO 90% OF THE TIME ON NUT RUNNING OPERATIONS ALONE. SIZE 4U—⅜" BOLT CAPACITY. SIZE 8U—½" BOLT CAPACITY

"Rotary Impacts" up to 1900 per minute—do the work and give you a tool with a more powerful turning effect than any other electric tool of comparable size.

- **It affords amazing savings on all operations—nut running as much as 90%.**
- **It uses standard attachments to perform all the operations shown—it gives full power in either direction.**
- **It eliminates all kick or twist even on the toughest jobs.**
- **It eliminates motor burn-outs because the motor continues to run even if you stall the spindle completely.**

An I-R IMPACTOOL pays for itself in 30 days with normal use.

It's hard to believe until you see it in action, so—Call your Ingersoll-Rand distributor and ask for a demonstration of the amazing new electric Impactool—or write to Dept. IT, 11 Broadway, New York 4, N. Y. for descriptive literature.

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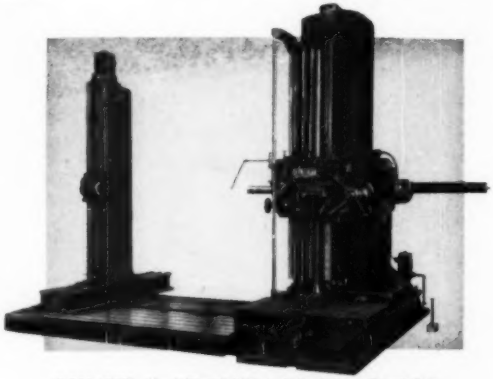
CINCINNATI-GILBERT *builds*

BALL BEARING RADIAL DRILLS — 3' arm 9" column to 8' arm 19" column

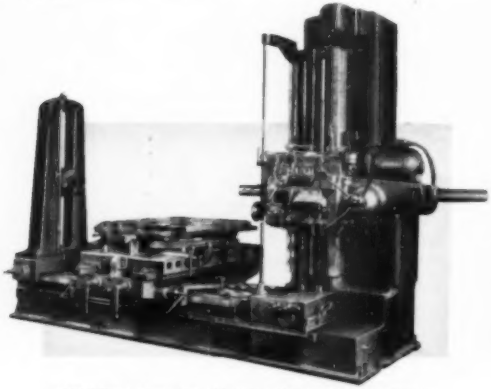
1. Ball Bearing Equipped.
2. Spindle has hardened tang plugs.
3. Pressure or Splash Lubrication to all units.
4. Ground Column.
5. Hardened and shaved alloy steel gears and ground multiple spline shafts.
6. Multiple Disc Friction Clutches.
7. Motor drive on arm.

SINGLE SPINDLE HORIZONTAL BORING, DRILLING AND MILLING MACHINES

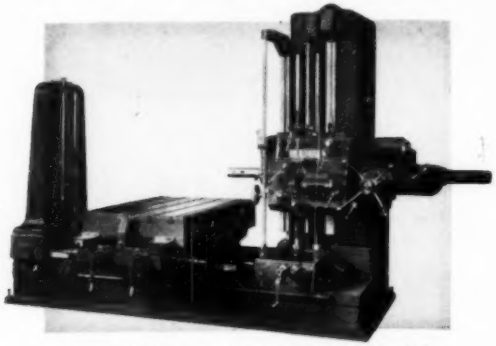
1. Hardened High Speed Single Spindle—1420 RPM.
2. Full Ball Bearing Equipped including Precision Preloaded Bearings for Spindle.
3. Hardened ways on bed (Table type) and on runway (Floor type).
4. Pressure or Splash Lubrication to all Units.
5. Hardened and Shaved Alloy Steel Gears and Ground Multiple Spline Shafts.
6. Centralized simple control for all movements.
7. Narrow guides with screws located within the guide for all sliding units.
8. Built in motor on head—no long shafts or bevel gears.
9. Can be equipped with Built-in Precision Thread Chasing Unit for Spindle.



FLOOR TYPE—Head Travel 36" to 96". Column Travel 36" to 144". Can be equipped with Floor Plates, Boring Bar Supports, Stationary, Sliding or Built-In Rotary Tables, Revolving Columns and special arrangements. Bulletin No. 1244.



COMPOUND BUILT-IN ROTARY TABLE TYPE—Tables—44" Circular or Square, Head Travel—36" to 60", Bed—84" to 120". Bulletin 348.



COMPOUND RECTANGULAR TABLE TYPE — Tables—38" x 60" Tables to 48" x 96", Head Travel—36" to 72", Bed—84" to 120". Bulletin No. 1040-R.

ATTACHMENTS AND ACCESSORIES

1. Precision dial and end measuring attachments.
2. Universal Tilting and Revolving Tables.
3. Plain hand revolved and worm revolved round or square tables.
4. Vertical, Semi-Universal and Full-Universal Milling Attachments.
5. Facing and Boring Heads.
6. Boring Bars and other tools.

THE CINCINNATI GILBERT MACHINE TOOL CO.

3360 BEEKMAN ST. • CINCINNATI 23, OHIO

Can you match these production figures?

THIS

TRADE Verson MARK

MAJOR PRESS BRAKE

- ✓ Punches 91 holes in 1 handling
- ✓ Reduces punching operations 60%
- ✓ Cuts production time by ⅔

Designed and built for gang punching operations, the Verson Major Press Brake illustrated above has made possible tremendous savings in time and material handling for a manufacturer of harvesting combines and allied equipment. The part produced in this machine is an 8′ 4″ long angle bar 2″ x 2″, ⅜″ thick which requires 91 ⅜″ holes. With the aid of air cylinders to straighten and clamp the piece (see close-up of die above) the Verson Brake punches all 91 holes in one handling. This compares with 10 to 12 operations previously required . . . time per piece is cut to ⅓ of previous requirements.

And this is not an isolated case, either — it is typical of how scores of manufacturers using modern equipment and materials, engineered by Verson, have slashed production costs. Whatever your metal forming or punching problem we'd like the opportunity to show you how Verson can speed your production and cut costs. *Write today!*

SKETCH OF THE FINISHED JOB DESCRIBED ABOVE

VERSON ALLSTEEL PRESS COMPANY

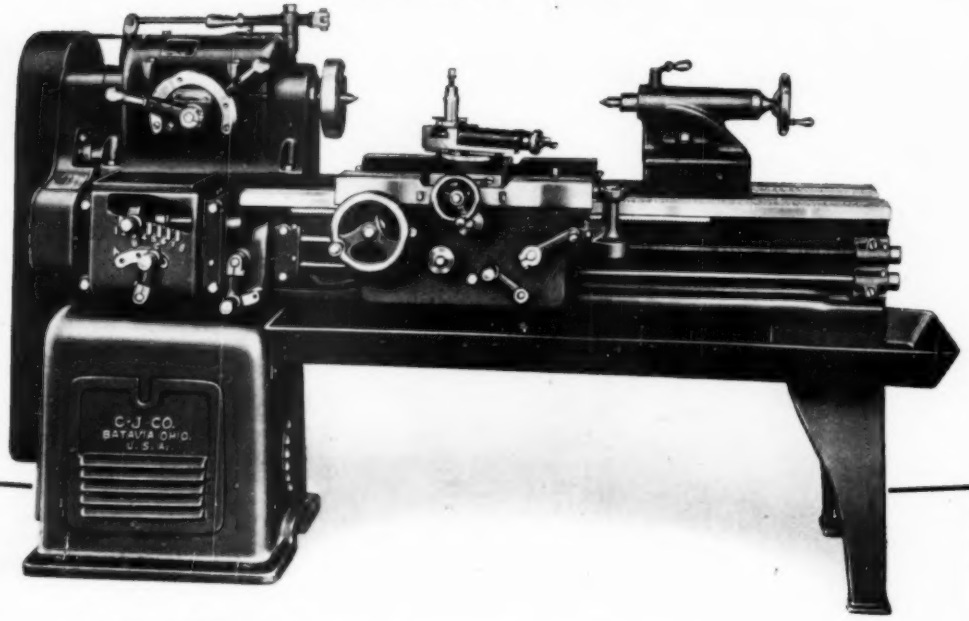
9316 South Kenwood Avenue, Chicago 19, Illinois — Holmes Street and Ledbetter Drive, Dallas 8, Texas

A VERSON PRESS FOR EVERY JOB FROM 60 TONS UP!

BLANKING PRESSES • FORGING PRESSES • DRAWING PRESSES • HYDRAULIC PRESSES
PRESS BRAKES • DIES • DIE CUSHIONS

C. & J. *GEARED HEAD* LATHES

16 INCH, 12 SPEED



Specifications

Swing over bed	16¼ in.
Swing over carriage	11⅜ in.
Diameter Tail Stock Sleeve	1-11/16 in.
Length Carriage Bearing	23⅜ in.
Width Cross Slide	5⅝ in.
Distance between centers 6-ft. bed	38 in.
Diameter Nose of Spindle	2⅜ in.
Hole in Spindle	1¼ in.
Morse Taper Center	No. 3
Lengths, Bed	5, 6, 8, 10, 12 or 14 ft.
Weight, 16 in. x 8 ft., crated	App. 3000 lbs.

● This C. & J. 16 inch, 12 speed, geared head lathe is built by a company which has devoted 45 years to the manufacture of lathes and is designed for high quality general service. Built in a plant specializing in only one size and one model, it is accurate, powerful and tooled and equipped to produce efficiently. These lathes follow approved modern practice in design and construction. They feature an exceptionally long carriage bearing (23⅜"). Carriage and tool slides are carefully hand scraped and carriage is finished on all surfaces. Feed is provided by separate rod leaving lead screw to be used only for thread chasing. Complete regular equipment includes thread indicator. Guaranteed accurate within .001 inch in 14 inches. Lubrication is fully provided for through special oil reservoirs and tubes to bearings. Deliveries favorable. Write for our new full descriptive bulletin 38-A-8.

THE CARROLL & JAMIESON MACHINE TOOL CO. MANUFACTURERS OF C & J ENGINE LATHES BATAVIA, OHIO.

THE CARROLL & JAMIESON MACHINE TOOL COMPANY

BATAVIA, OHIO

50-ton Bliss No. 62 Punch Presses mounted on UNISORB at Styeberg Engineering Co., Racine, Wisconsin

NO FLOOR DAMAGE

...Because There's No DRILLING!

Eliminate Bolts and Lag Screws ... Mount Machinery on UNISORB

Easy to install, UNISORB-Mounting requires none of the maintenance care and expense you've been used to.

A special cement (we supply it) binds the UNISORB pads to machine feet and floor with a holding strength of 1500 lbs. per sq. foot *minimum.*

And it absorbs from 60% to 85% of transmitted noise and vibration . . . saves floors, building, machinery . . . often permits higher machine speed.

You'll want all the facts handy the next time you move a machine, or add a new machine — *or a new plant* — to your operation.

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LOOK FOR THE RED CENTER AND UNISORB BRAND MARK

THE FELTERS COMPANY

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HARDINGE
ELMIRA, N.Y.

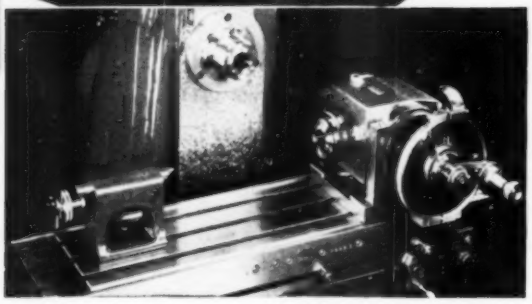
HIGH SPEED PRECISION MILLING MACHINE

FOR

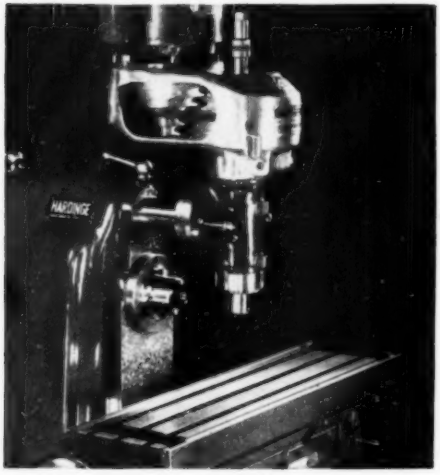
TOOL ROOM AND LABORATORY

Tool room and laboratory work, because of the variety, demands useful milling machine attachments. Hardinge knows this. Illustrated are two attachments in addition to the arbor and vise shown below. Other attachments are: Power feed for table; oil coolant facilities; 360° swivel base, also right angle base for dividing head; taper hole collets, as well as regular collets; step chucks and jaw chucks for dividing head.

Write for Bulletin TM-UM



Modern design universal plain dividing head and tailstock. Designed to match the precision qualities of the machine. Features are: Preloaded ball bearing spindle; takes standard 1" capacity collets same as used in horizontal spindle; and high speed indexing, 4 to 1 ratio.



This attachment provides high speed vertical milling. Has separate motor driven preloaded ball bearing spindle — eight selective speeds from 465 to 4250 r.p.m.—takes standard ½" capacity collets. Vertical head swivels to angular settings.

HARDINGE BROTHERS, INC., ELMIRA, N. Y.

"PERFORMANCE HAS ESTABLISHED LEADERSHIP FOR HARDINGE"

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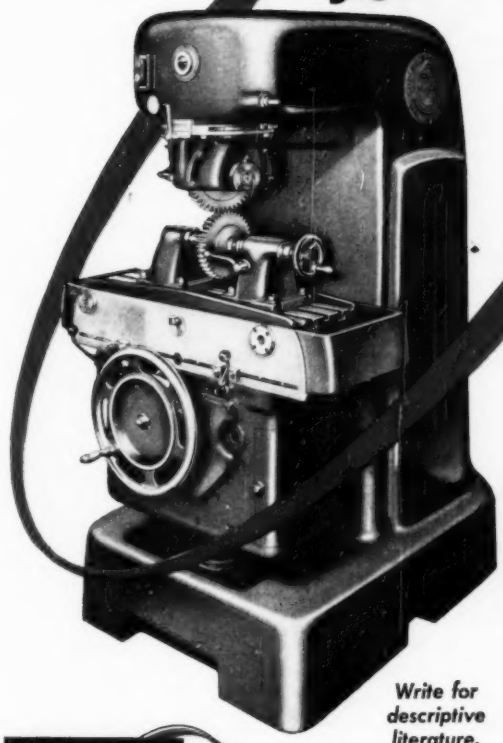
SHAVING ASSURES BETTER GEARS AT A GREATER OVER-ALL

Production Economy



Write for descriptive literature.

This gear shaving machine, the first of its kind, was introduced 16 years ago to fulfill the urgent need of gear manufacturers for a means of correcting precision gears and gears produced to operate under critical loads and speeds—these corrections to bring them within required tolerances.

Today, it is being used by all the leading manufacturers in the automotive industry, the majority of gear jobbing shops and nearly all the machine tool builders.

One gear manufacturer says shaving has reduced rejects which formerly amounted to about 50% to none. Another says that shaved gears have cut operating power requirements approximately 20%.

Gear shaving eliminates the need for skilled machinists, regardless of the degree of precision required. Accuracy does not depend on the shaving machine operator. Shaving also makes it easier to turn out acceptable gears. The teeth of shaved gears have uniform accuracy and the characteristics of all the gears in any lot will be uniform.

SPUR AND HELICAL GEAR SPECIALISTS
ORIGINATORS OF ROTARY SHAVING AND ELLIPTOID TOOTH FORM

NATIONAL BROACH AND MACHINE CO.
5600 ST. JEAN . . . . . DETROIT 13, MICHIGAN

WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT

This prescription raised production 50%

Vitamin "C"?—Carboloy Cemented Carbide, of course.

It was a Carboloy engineer who turned the trick. Here's the story:

On installing a new boring machine recently, a small plant in Pennsylvania was sadly disappointed to get no better production from it than they had from the old one. So they called in a Carboloy engineer.

Now? Thanks to his suggestions, the new machine is turning out half again as many pieces—twelve cast-iron wheels an hour instead of the previous eight.

Why was he able to help them? Here's the reason: Carboloy engineers spend most of their time working with Carboloy Cemented Carbides. They've come up against almost every type of carbide problem you can imagine, in their time. They're experts—specialists in carbides.

Try this prescription yourself!

You, too, can back up the intimate knowledge of your own production men with this specialized "know-how" of Carboloy engineers. They can bring to your plant a broad experience in obtaining maximum results with carbides.

Slight changes in tool design, speeds or feeds, grinding, or tool handling often effect far reaching economies and increases in out-put.

Together, your engineers and our Carboloy specialists can form a team nothing can stop. Together they can use carbides to cure many of your production ills.

Ask for your Carboloy engineer

Your Carboloy engineer will be glad to help you with your carbide problems; or in the selection of the most economical tooling from any of Carboloy's 600 standard tools and blanks, or special Carboloy-tipped tools made by more than 150 tool manufacturers.

Why not call your Carboloy engineer? Or write us direct: Carboloy Company, Inc., 11149 E. 8 Mile Road, Detroit 32, Michigan.

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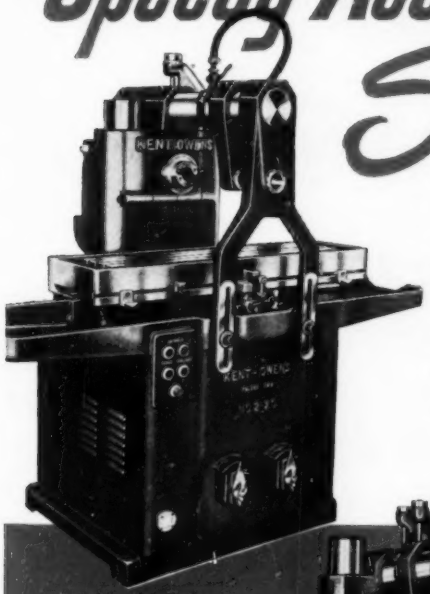
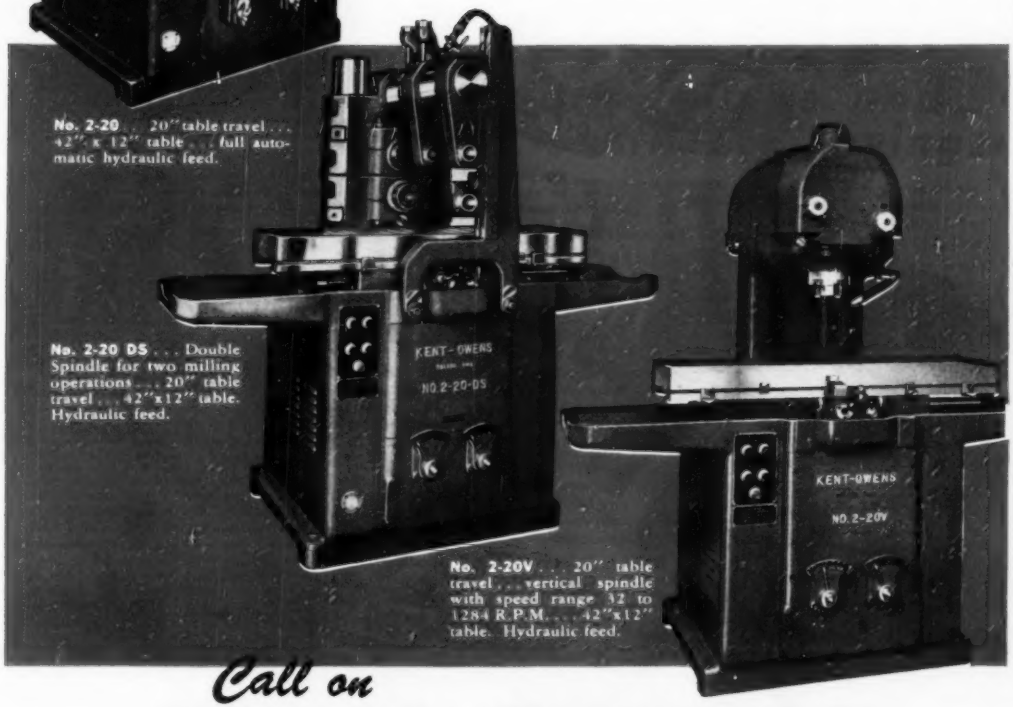
CARBOLOY®
CEMENTED CARBIDE

Speedy Accurate Milling Saves Labor!



On countless jobs—Kent-Owens Milling Machines have shown ability to turn out work with top speed and high accuracy. They're designed for rapid, easy set-up and operation. Rugged . . . with twin-post head mounting that assures balanced load—no chattering. Practical features throughout to help you *produce more* . . . with *lower costs!* Write for bulletins on the Kent-Owens Standard line . . . including wide range of hydraulic and hand operated machines. Also, let our engineers help you with tooling and special machine requirements.

Kent-Owens Machine Co., Toledo, Ohio.



No. 2-20 . . . 20" table travel . . . 42" x 12" table . . . full automatic hydraulic feed.

No. 2-20 DS . . . Double Spindle for two milling operations . . . 20" table travel . . . 42"x12" table. Hydraulic feed.

No. 2-20V . . . 20" table travel . . . vertical spindle with speed range 32 to 1284 R.P.M. . . . 42"x12" table. Hydraulic feed.

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KENT-OWENS

For Milling Machines

each operator of H&G Insert Chaser DIE HEADS

threads more pieces with H&G Insert Chaser DIE HEADS

has less downtime H&G Insert Chaser DIE HEADS

when you change to insert chaser die heads

H&G Insert Chaser DIE HEADS

MACHINE DOWNTIME is cut to the bone when you use H&G Insert Chaser Die Heads. You can use any grade of labor, male or female, as experience is unnecessary. This has been proved in thousands of cases during and since the war. Here's why:

NO SKILL IS REQUIRED – Insert chasers are quickly and correctly replaced by any one who can read 1, 2, 3, 4, on the respective chasers and their positions in the die head. In no other die head are chasers changed in such a simple way.

TIME IS SAVED – A set of insert chasers can be replaced in 2 minutes. No set-up man, foreman, or supervisor is required. This is what the operator does for each chaser in turn: (1) Remove the draw-in screw, (2) replace the worn chaser with a sharp chaser of the same number, (3) replace and tighten the draw-in screw.

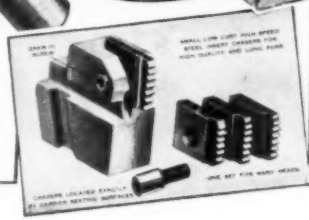
The chaser is located exactly by the seating surface in the carrier. No setting gages are required. Production is resumed at once. In most shops during a day, as much as one hour downtime can be saved through the simplicity of H&G Insert Chaser and carriers.

AND ECONOMY TOO – H&G Insert Chasers are much smaller than conventional chasers, cost less to buy. Yet they produce threads accurate to Class 3 specifications for surprisingly long runs between grinds. And, when worn, they can be resharpened a number of times on a simple fixture or entirely disregarded because they cost so little.

Write today for literature, stating the type of equipment used for screw thread cutting. We can then make specific recommendations for improving production, finish and accuracy. If you are interested, one of our field engineers with your cooperation will help to make thread-cutting survey without obligation and a proposal based on the findings. THE EASTERN MACHINE SCREW CORPORATION.
20-40 Barclay Street,
New Haven, Conn.

H&G Insert Chaser DIE HEADS

2 min. to change chasers

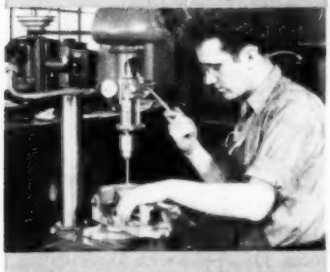


Free

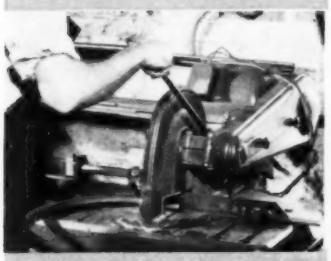
BULLETIN 32
"Selecting the Proper Die Head for the Job"

Delta's line of band saws includes Delta 14" Metal-Cutting Band Saw, shown in use here, and the new Delta 20" Band Saw for cutting wood, plastics, and soft metals such as brass, copper, and aluminum.

Delta's line of abrasive finishing machines includes the Delta Abrasive Belt Finishing Machine used above, the Delta Abrasive Disk Finishing Machine, and the new Delta Belt Grinding, Polishing, and Deburring Machine.



Delta's line of drill presses include 14" and 17" single- and multiple-spindle, bench and floor models, with manual or power feed. Also included are Delta Super-Hi* Drill Presses, for small-hole work from .025" to ¼" diam.



Delta Cut-Off Machines are available in a non-ferrous model and an abrasive model that is also adaptable for cutting wood.

Delta's line of grinders includes this Delta Toolmaker* Surface Grinder, as well as the Delta Toolmaker Chip-Breaker Grinder, Delta Toolmaker Tool and Cutter Grinder, Delta Carbide Tool Grinder, and Delta Grinder with Twin-Lite* Safety Shields.

Here's how DELTA-MILWAUKEE® Machine Tools help you *maintain volume and quality — with big savings*

There are many ways you can use low-cost Delta-Milwaukee Machine Tools to cut your operating costs, without penalizing output and quality: Here are three . . .

1. You can build high-production, special-purpose machines using standard Delta components—without the delay and heavy capital outlay ordinarily involved in buying inflexible special machines of limited usefulness. Machines using Delta components are readily convertible when change overs are required.
2. You can modernize many obsolete machines, by replacing worn-out assemblies with standard Delta components—thus saving the expense of new machines.
3. You can utilize the portability and compactness of Delta-Milwaukee machines to revise or supplement your present production methods, for more efficient operation.

DELTA MILWAUKEE®

Delta's savings in cost — and in weight and space — are not obtained at the expense of quality. They result from advanced design and from quantity production of standard models.

Take advantage of the many uses of Delta-Milwaukee machines, to cut your investment risk in tools and retain more liquid working capital. Inspect them at your nearby Delta distributor. Ask him about buying on easy time payments.

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ROCKWELL MANUFACTURING COMPANY
MILWAUKEE 1, WISCONSIN

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*Trade Mark Reg. U. S. Pat. Off

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608A E. Vienna Ave., Milwaukee 1, Wis.

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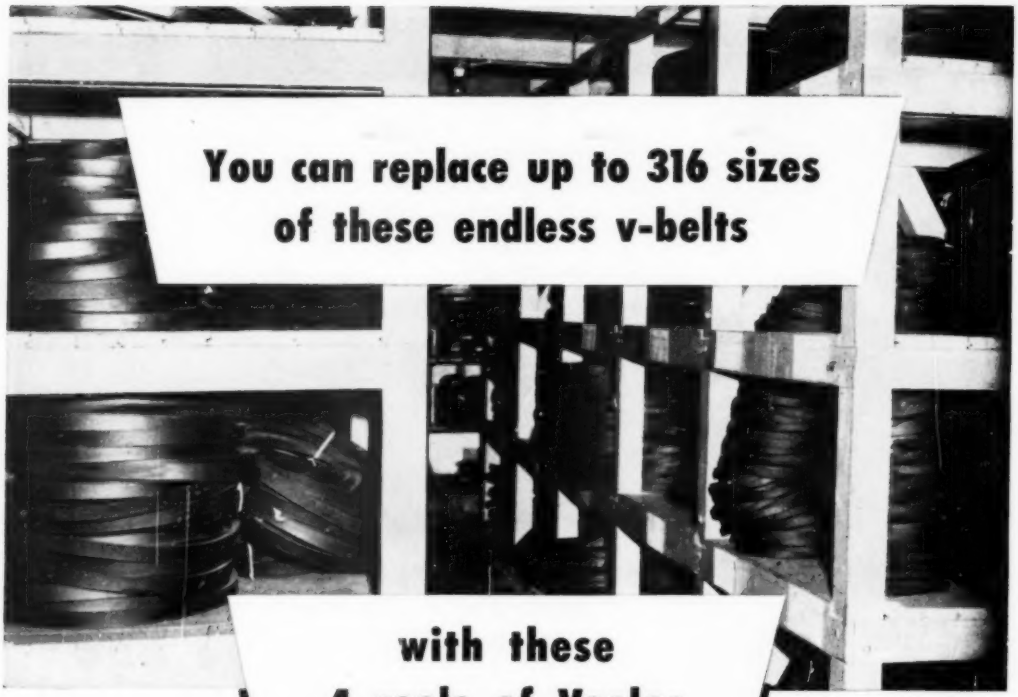

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with these 4 reels of Veelos

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Ease of installing Veelos provides substantial savings in installation time. On drives with fixed centers, it is installed without moving the motor or dismantling the machine.

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THE LINK
V-BELT

NEW CATALOG gives you all the facts about the important advantages of Veelos and supplies complete engineering data. Fully illustrated, it shows Veelos at work in industry after industry. Your copy sent on request.

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MANHEIM, PENNSYLVANIA

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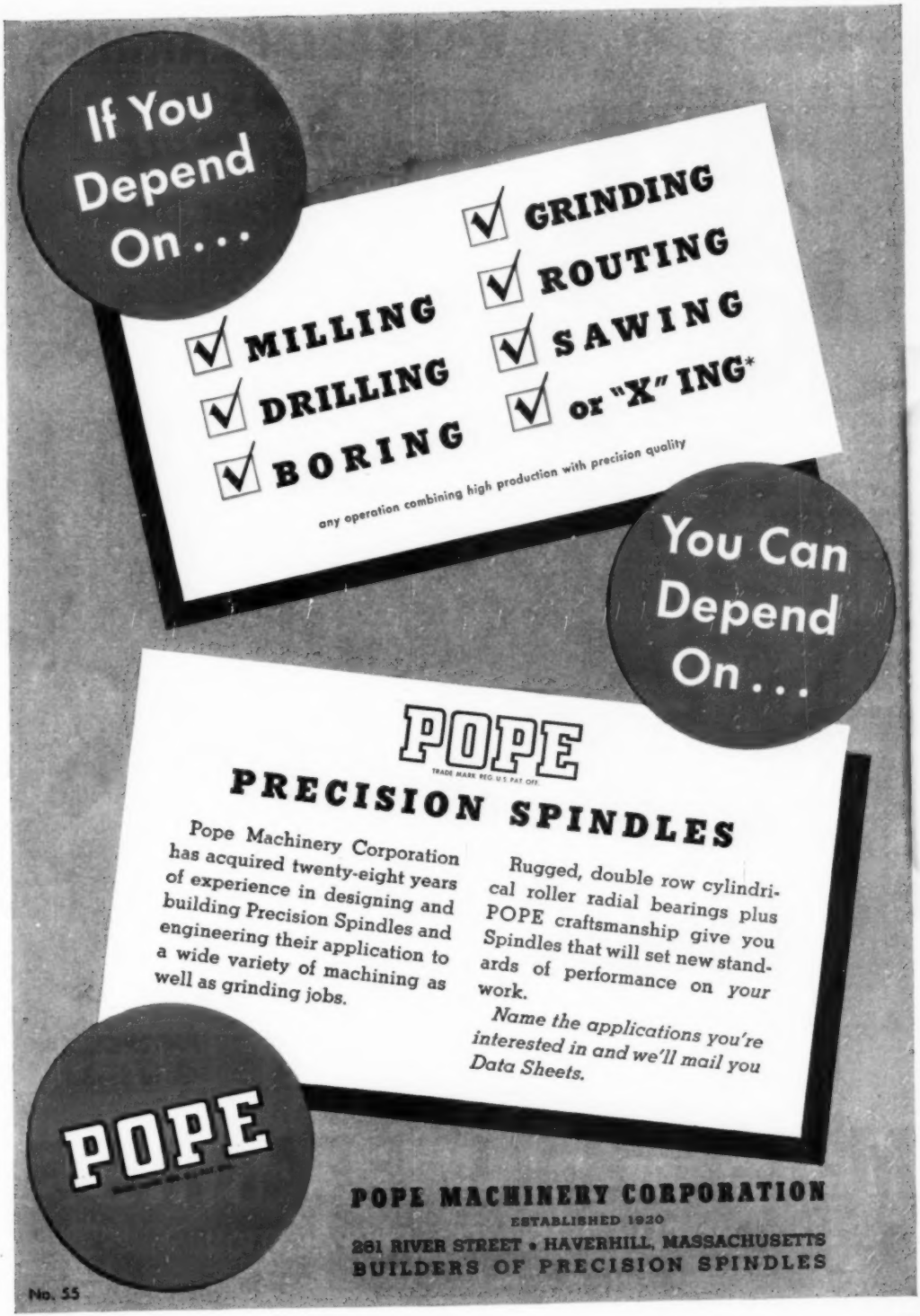
ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE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☑ or "X" ING*
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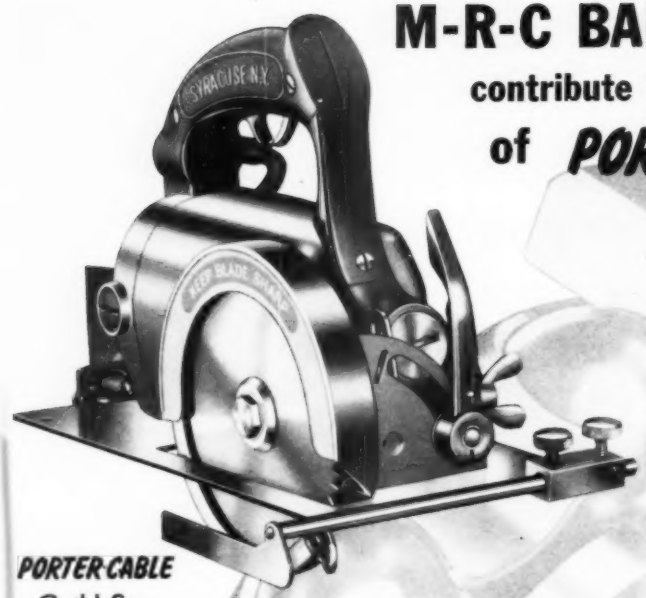

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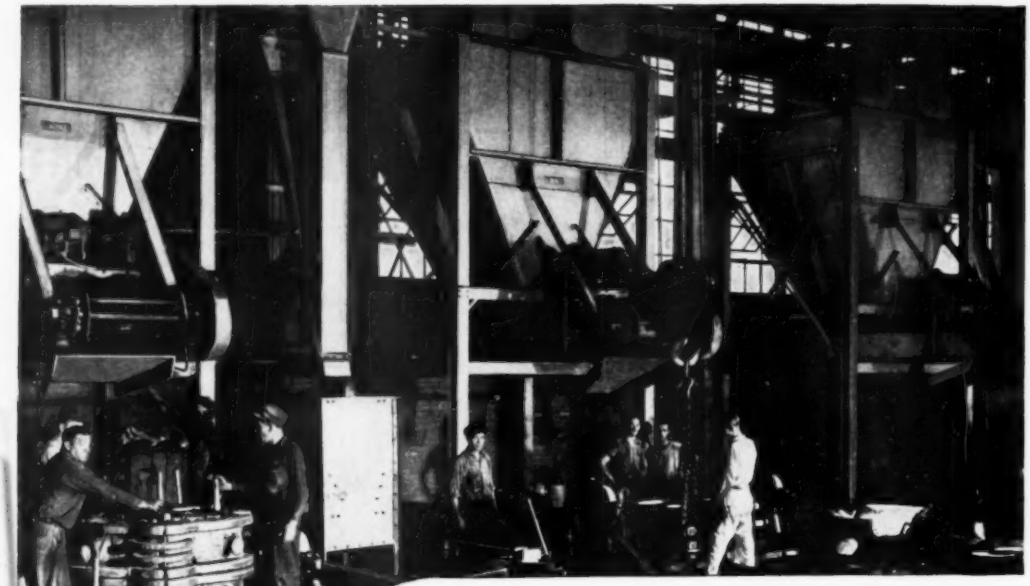
Bunting Alloy Number			PHYSICAL PROPERTIES								CHEMICAL COMPOSITION									Alloy Number		
Standard Stock	Preferred Alternate	Second Alternate	Order of Anti-Friction Property	Impact Value Charpy Test	Yield Strength Compressive Limit	Ultimate Strength Tensile	Yield Strength Tensile	Elongation Tension	Brinell Hardness 10 mm Ball—500 Kg Load	Rockwell—E Scale Hardness 1/8" Ball—100 Kg Load	Copper Cu	Tin Sn	Lead Pb	Zinc Zn	Iron Fe Max.	Antimony Sb Max.	Nickel Ni Max.	Phosphorus P Max.	Other Elements Max.	SAE Equivalent	Similar Alloys	BUNTING Alloy Number
	158		1	2.9	13,000	20,000	10,000	8%	38	27	69.00 71.00	4.50 5.50	23.50 26.50		.20	.20	.20	.05	.35			158
	125		2	2.7	14,000	22,000	11,000	12%	40	32	73.00 77.00	4.00 5.00	18.00 23.00	1.00 Max.	.20	.20	.25	.05				125
	124		3	5.4	17,000	28,000	14,000	15%	50	52	84.00 86.00	4.50 5.50	8.00 10.00	1.50 Max.	.20	.20	.25	.10		66		124
	135		4	2.4	18,000	28,000	14,000	15%	52	55	75.00 79.00	7.00 9.00	13.00 17.00	1.00 Max.	.20	.20	.25	.05				135
		162	5	2.7	20,000	30,000	15,000	15%	55	59	69.00 73.00	8.50 9.50	17.50 22.50		.20	.20	.25	.05	.25			162
72			6	3.8	20,000	34,000	16,000	18%	58	63	81.00 85.00	6.50 7.50	6.00 8.00	2.00 4.00	.20	.20	.35	.15	.20	660		72
		27	7	2.6	21,000	35,000	17,000	18%	60	65	78.50 81.50	9.00 11.00	9.00 11.00	0.75 Max.	.20	.20	.25	.10		64		27
		147	9	5.6	17,000	35,000	17,000	15%	60	65	85.00 89.00	7.50 9.50	.75 1.50	2.25 4.25	.20	.20		.05 .10	.25	621		147
	96		8	5.8	22,000	40,000	18,000	20%	65	70	86.00 89.00	9.00 11.00	2.00 3.00	1.00 Max.	.20	.20	.25	.10		63		96
		98	10	3.7	22,000	40,000	18,000	20%	65	70	86.00 89.00	9.00 11.00	0.35 Max.	1.00 3.00	.06	.20	.25	.10		62		98
		156	11	1.7	22,000	40,000	18,000	20%	67	72	88.00 90.00	10.00 12.00	0.50 Max.	0.50 Max.				.10 .30		65		156
	164		12	2.7	23,000	40,000	18,000	20%	70	75	85.25 87.75	10.00 12.00	1.00 1.50		.30	.20	.75 1.25	.30 .20	.25	640		164
		143	13	0.8	24,000	40,000	18,000	10%	76	80	84.00 86.00	13.50 14.50	1.50 Max.	0.25 Max.	.20	.20		.10	.25			143

● This is the alloy page from the paper, "Cast Bronze Bearing Alloys". We will send you the complete paper on request.

THE BUNTING BRASS & BRONZE COMPANY, TOLEDO 9, OHIO

BRANCHES IN PRINCIPAL CITIES



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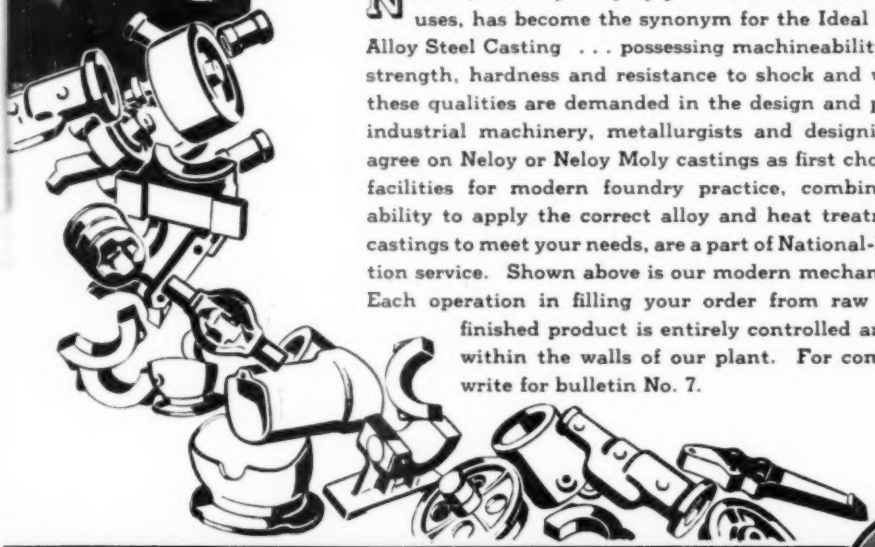
NELOY, or Neloy Moly by performance in its broad range of uses, has become the synonym for the Ideal Heat Treated Alloy Steel Casting . . . possessing machineability, toughness, strength, hardness and resistance to shock and wear. Where these qualities are demanded in the design and production of industrial machinery, metallurgists and designing engineers agree on Neloy or Neloy Moly castings as first choice. Modern facilities for modern foundry practice, combined with the ability to apply the correct alloy and heat treatment of steel castings to meet your needs, are a part of National-Erie Corporation service. Shown above is our modern mechanical foundry. Each operation in filling your order from raw materials to finished product is entirely controlled and completed within the walls of our plant. For complete details write for bulletin No. 7.



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Sunbeam STEWART

THE BEST INDUSTRIAL FURNACES MADE

Regardless of whether you heat treat in small quantities or continuous production, Sunbeam Stewart engineers are well qualified to recommend the correct furnaces to meet your requirements.

As a division of Sunbeam Corporation we have the opportunity of working with our furnaces in the production of Sunbeam appliances, lawn sprinklers, sheep shears, animal clippers, etc. In manufacturing our own products we must contend with practically every heat treating problem faced by industry—a position unique in the furnace manufacturing field.

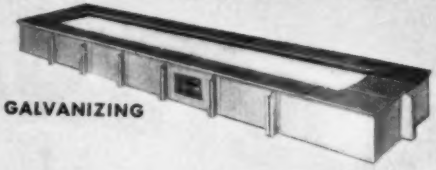
This experience with our own furnaces in both small or large volume production enables us to render a service to you far beyond other manufacturers. That is one reason why Sunbeam Stewart Furnace installations have been so successful. They are based not only on furnace engineering ability, but on practical experience under actual operating conditions. We have learned through actual experience the factors that give longest furnace life . . . greatest production . . . best quality . . . and lowest operating cost.

Our highly trained technical staff of furnace engineers, who for over 50 years have built furnaces for the leading companies throughout the United States and abroad, are qualified to recommend the correct type of furnace to meet your requirements.

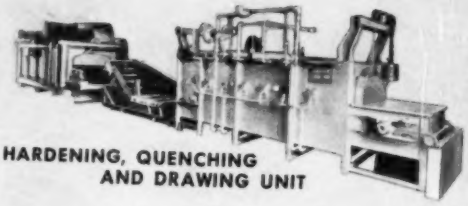
A letter, wire or 'phone call will promptly bring you information and details on Sunbeam Stewart Furnaces, either units for which plans are now ready or units especially designed to meet your needs. Or, if you prefer, a Sunbeam Stewart engineer will be glad to call and discuss your heat treating problem.

THERE IS A SUNBEAM STEWART INDUSTRIAL FURNACE FOR EVERY NEED

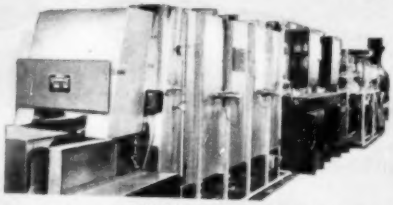
GAS · ELECTRIC · OIL



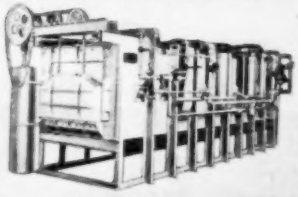
GALVANIZING



HARDENING, QUENCHING AND DRAWING UNIT



FURNACE BRAZING



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SUNBEAM STEWART INDUSTRIAL FURNACE DIVISION of SUNBEAM CORPORATION

(Formerly CHICAGO FLEXIBLE SHAFT CO.)

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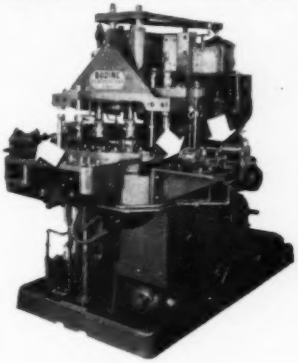
HERE'S HOW

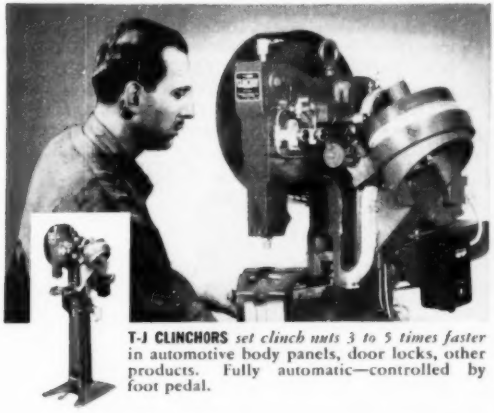
T-J SAVES LABOR

ON THOUSANDS OF JOBS FOR INDUSTRY!

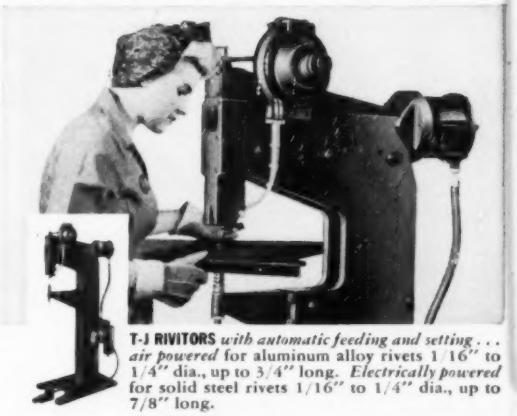
T-J HYDRAULIC CYLINDERS *simplify machines* . . . save time and labor on jobs where pushing, pulling or lifting is needed . . . 100 lb. or 50,000 lb. Shown here — a shell loading press with T-J Cylinders.



T-J AIR CYLINDERS *do push-pull-lift jobs* . . . 100 lb. to 12,000 lb. . . . wide range of styles, sizes and strokes. Shown here — Automatic Drilling and Threading Machine with T-J Cylinders.

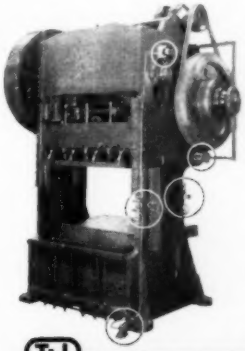


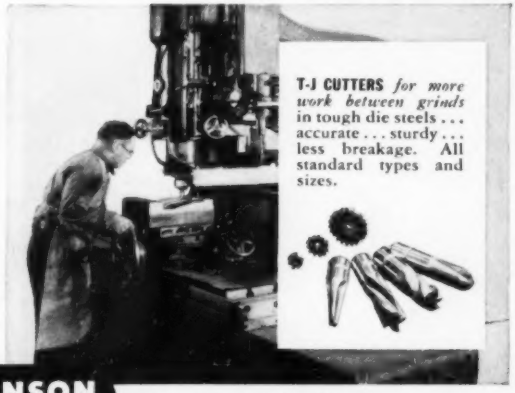
T-J CLINCHORS *set clinch nuts 3 to 5 times faster* in automotive body panels, door locks, other products. Fully automatic—controlled by foot pedal.



T-J RIVITORS *with automatic feeding and setting . . . air powered* for aluminum alloy rivets 1/16" to 1/4" dia., up to 3/4" long. *Electrically powered* for solid steel rivets 1/16" to 1/4" dia., up to 7/8" long.

T-J AIR CONTROLS *provide accurate, automatic control* for presses, brakes, other machines and equipment . . . designed for air cylinders in semi-automatic or automatic cycles.





T-J CUTTERS *for more work between grinds* in tough die steels . . . accurate . . . sturdy . . . less breakage. All standard types and sizes.

Send for catalogs.
The Tomkins-Johnson Co.
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RIVITORS, AIR AND HYDRAULIC CYLINDERS, CUTTERS, CLINCHORS

32 YEARS EXPERIENCE

The Cincinnati....
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TRADITIONALLY FINE TOOLS!

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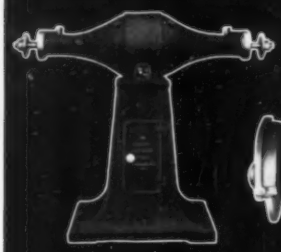
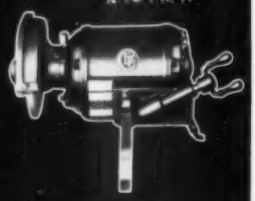
PORTABLE GRINDERS—5", 6", AND 8" WHEEL CAPACITIES



TOOL POST GRINDERS
¼ TO 1 H. P.



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THE CINCINNATI ELECTRICAL TOOL CO.
Division of THE R. K. LeBLOND MACHINE TOOL CO.

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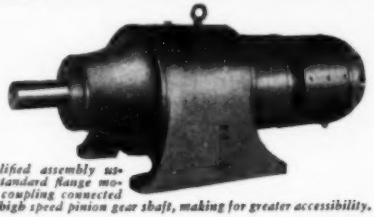
D.O.James
Established 1888

MOTORIZED GEAR SPEED REDUCERS

A CENTRALLY BALANCED DRIVE WITH GREAT EMERGENCY STRENGTH



Simplified assembly using standard flange motors, coupling connected with high speed pinion gear shaft, making for greater accessibility.

SINCE 1906 . . . When the first D.O.James Motorized Gear Speed Reducer was built . . . We have improved the design and manufacture of Motorized Gear Reducers, maintaining in them the same high quality of manufacture as our other standard Gear Speed Reducers.

The many advantages of D.O.James Motorized Gear Speed Reducers and their continued proven performance for many years make them a leading choice with power transmission designers and engineers.

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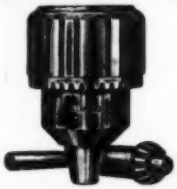

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STRAIGHT SIDE SINGLE CRANK PRESSES

for heavy blanking and forming

Heavier classes of blanking and forming work can be handled efficiently and economically on these presses.

Sturdily constructed with either solid frame or built up with tie rods. Small elastic deflections do not affect tool alignment. All stresses taken centrally. Made also with wedge adjustment for slide for very close work.

Full details on request.

Straight Side Press

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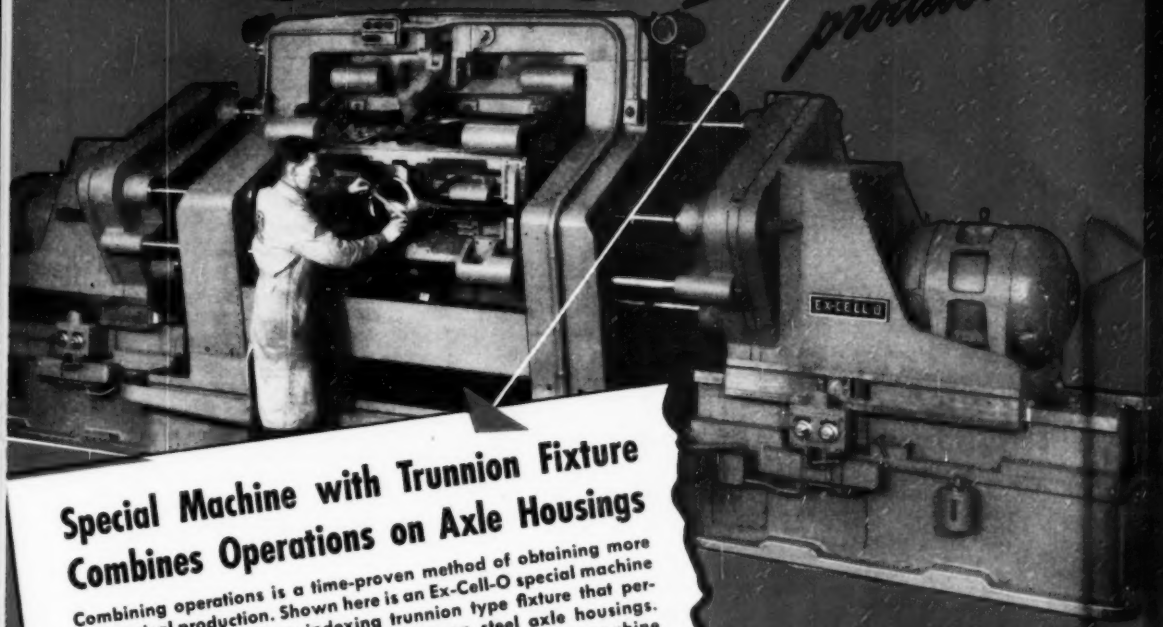
EX-CELL-O

Can give you more economical production



Special Machine with Trunnion Fixture Combines Operations on Axle Housings

Combining operations is a time-proven method of obtaining more economical production. Shown here is an Ex-Cell-O special machine with a six-station power indexing trunnion type fixture that performs roughing and finishing operations on steel axle housings. Standard hydraulically-actuated slides at both ends of the machine carry multiple spindle heads and their drive motors. Another slide at the rear supports a precision spindle and a facing head.

The tool holders in both the multiple spindle heads are rigidly guided by bushings in the fixture end frames. Coolant is manifolded to each station and directed through drilled holes to the point of contact between the tools and the work.

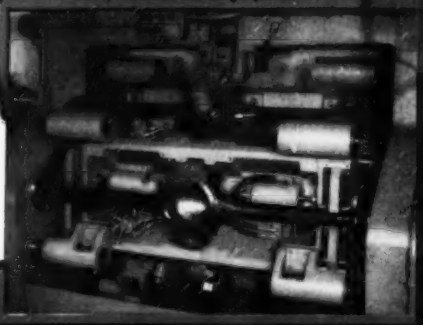
Parts are laid in the loading station and are located and clamped hydraulically. Operations are rough, semi-finish bore and ream bearing diameters at both ends; rough and finish face flanges, chamfer inside and outside edges of flanges and turn O.D. of flanges at both ends; face banjo. All these operations are performed at a net production rate of 55 pieces per hour!

Let Ex-Cell-O help you combine operations for more economical production. A complete staff of experienced machine tool engineers is ready to help you with your production problems. Contact your Ex-Cell-O representative today!

XLO
EX-CELL-O for PRECISION

Above: Ex-Cell-O special machine performs many operations on steel rear axle housings.

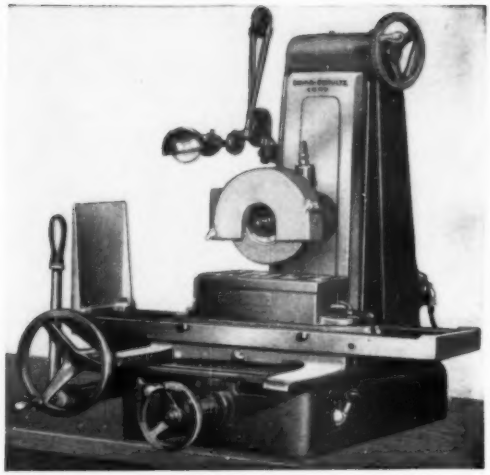
Below: Close-up view of the Ex-Cell-O six-station trunnion type fixture which easily handles the large parts.



EX-CELL-O CORPORATION

Detroit 32, Michigan

Special Multiple Way-Type Precision Boring Machines • Special Multiple Precision Drilling Machines • Precision Boring, Turning, and Facing Machines and Fixtures • Precision Cylinder Boring Machines • Precision Thread Grinding Machines • Precision Lapping Machines • Precision Broach Sharpening Machines • Other Special Purpose Machines • Tool Grinders • Continental Cutting Tools • Broaches and Broach Fixtures • Counterbore Sets • Grinding Spindles • Hydraulic Power Units • Drill Jig Bushings • R.R. Pins and Bushings • Fuel Injection Equipment • Dairy Equipment • Aircraft and Miscellaneous Production Parts



SAVE 3 WAYS

WITH BOYAR-SCHULTZ No. 6-12 BENCH MODEL SURFACE GRINDER

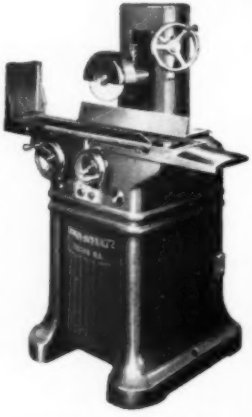
(1) *Saving in Time.* This saving alone will justify one or more No. 6-12 Bench Model Grinders installed on tool makers' benches or in convenient places in the tool room, instantly available for close tolerance grinding of the many important small jobs encountered in every shop.

(2) *Saving in Operation.* Large grinders cost more to operate, as much for the small job as for many larger jobs. Set-up time in larger machines is also a factor.

(3) *Saving in Cost.* Boyar-Schultz No. 6-12 Surface Grinder, while its capacity is nearly equal to many large machines, is priced so low that it is real economy to place one, two or three of them at strategic points in your tool room to save sending small work to large machines.

Designed to take over the tool room's smaller jobs requiring high precision grinding. Built of the finest materials and workmanship, it is sturdy, long lasting and will maintain its accuracy on all important work called upon to perform.

MODEL 6-18 PRECISION SURFACE GRINDER



Many superior features make this Boyar-Schultz Surface Grinder an outstanding performer in producing the fine finish and extreme accuracy necessary in fine gage, grinding, tool and die work as well as in some production grinding.

Its sturdy ruggedness maintains that fine accuracy for a long period of time . . . much longer than similar machines are expected to last.

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BOYAR-SCHULTZ CORPORATION
2109 Walnut St. Chicago 12, Ill.

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the "swing" is to

SPECIAL MACHINERY

AND

the "orders" are going to—

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BUILDING COMPLETE MACHINE TOOLS
UNITS FOR MACHINE TOOLS
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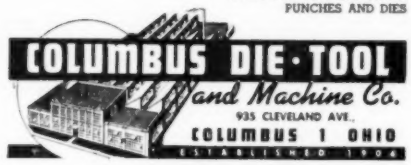

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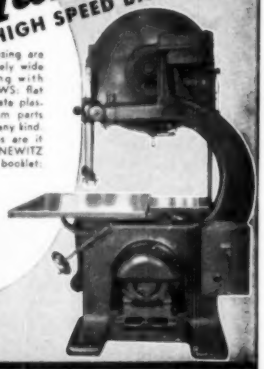
for Sawing **METAL** *as* **HARD** *as a* **FILE**
or Trimming **FORMED PARTS**
- FAST!

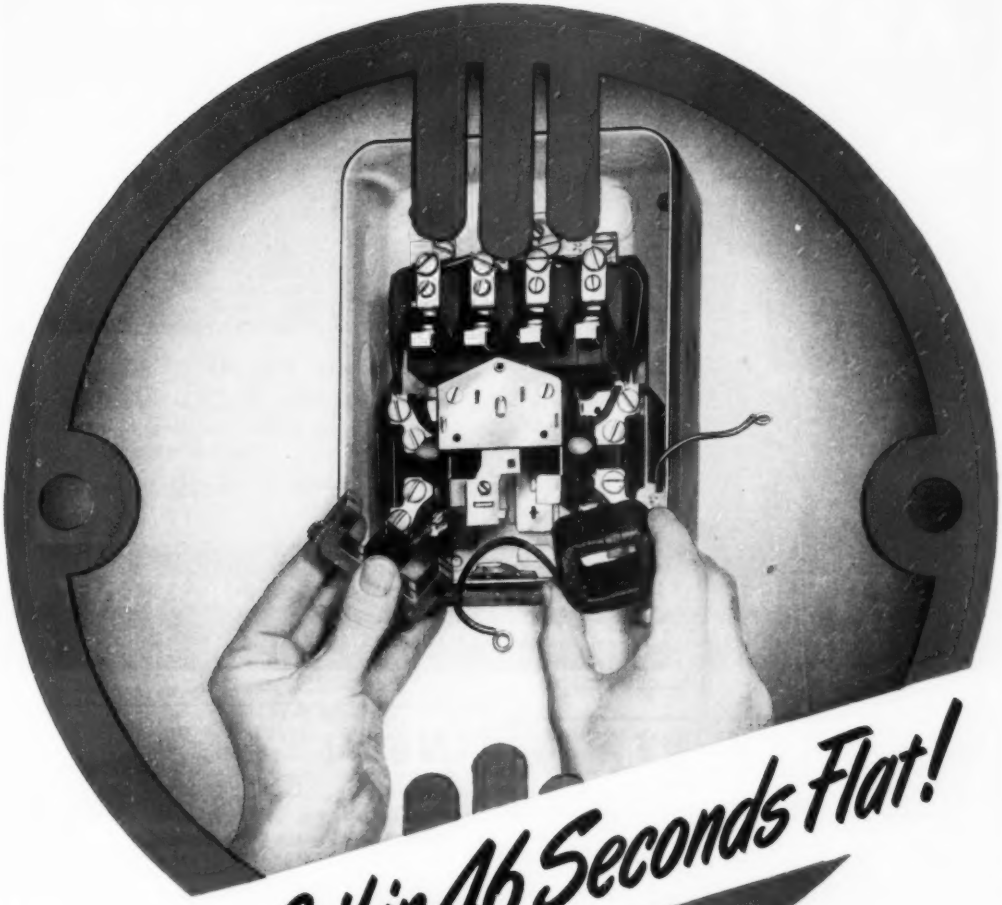
Actual photo of file friction sawn on Tannewitz High Speed Band Saw.

Tannewitz
HIGH SPEED BAND SAWS

Cost reductions that are downright amazing are effected in the cutting of an extremely wide variety of materials by friction sawing with TANNEWITZ HIGH SPEED BAND SAWS: flat sheets, hardened or soft steels, armor plate plastics, and many others. Formed aluminum parts can be trimmed without using a rest of any kind. Whatever your cutting problem, chances are it can be done faster and better with TANNEWITZ HIGH SPEED BAND SAWS. Write for booklet: "FRICTION SAWING."



THE TANNEWITZ WORKS
GRAND RAPIDS 4, MICHIGAN



Change Coil in 46 Seconds Flat!

Change is FASTEST, EASIEST with Federal Noark Motor Starter

IT'S ALMOST "PRESTO, CHANGE!" replacing a coil in Federal Noark Motor Starters. Only three quick operations to get the old coil—three more, in reverse, to insert the new one. Federal design is the simplest, fastest on the market today. All parts readily accessible from the front. Saves time, effort and money.

What's more, there's almost no chance for trouble in Federal Noark Motor Starters. There's only one moving unit and that *rides on ball bearings*—an exclusive Federal feature!... Important, too, Federal permits the choice of getting automatic or manual reset instantly... simply turn a knob and you've the type of overload protection that you want.

Order Federal Noark Motor Starters from your Federal Distributor. And write us for free copies of the "Federalog" and "Simplified Motor Control" giving full descriptions. Federal Electric Products Company, 50 Paris St., Newark 5, New Jersey.

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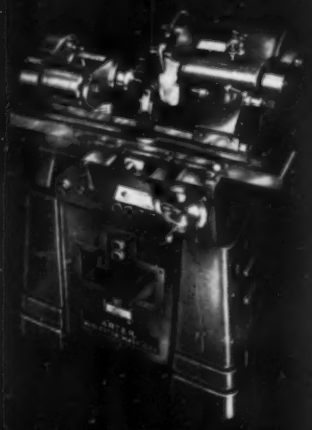
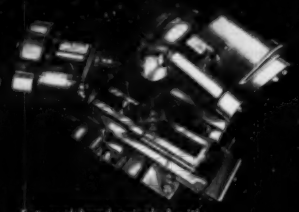
Complete line of Federal Electric Products includes Motor Controls, Safety Switches, Service Equipment, Circuit Breakers, Panelboards, Switchboards, Bus Duct ★ Sales offices in principal cities.

ARTER

Combination External and Internal Grinder-In-One



Internal grinding head with work head swiveled



External head swiveled with quick collet closing attachment and radius dresser

ARTER Model No. 103

Here is versatility. Arter hydraulic grinder, external or internal. . . . With internal head—capacity ⅛" to 3" dia. x 4" long—or external head—capacity 3" dia. x 10" long. Swing over table, 9".

Here is an economical, dual purpose grinder—internal only or external only—or both.

ARTER GRINDING MACHINE COMPANY

WORCESTER, MASSACHUSETTS • U. S. A.

KEYSEATING

The Modern Way

Illustration shows typical set-up for cutting taper keyways with table tilted.

Machines are made in three sizes for keyways 1/16" to 1¼" in width.

Great simplicity and ease of operation of Davis Keyseaters assure the user of accurate, time saving work.

Let our engineer study your keyseating problems.

DAVIS KEYSEATER COMPANY

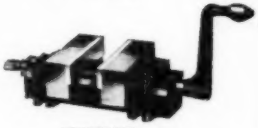
403 EXCHANGE ST. ROCHESTER, N. Y.

NEW!

SWIVEL-BASE with exclusive "Adjustable Zero."

SWIVEL-BASE

CENTERING varying diameters of work always centered under drill.



CENTERING

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BAUMBACH *The* DIE SET AUTHORITY

All Baumbach Die-Sets have demountable Leader Pins and Bushings. This exclusive feature permits removing Leader pins for machine work on the die shoe and assures reassembly without loss of alignment. A big time and trouble saver. Write for Catalog.

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LUERS

Pretested Cutting Off Tool Holders
Patented Cutting Off Blades

ONLY the PATENTED construction of LUERS cutting off BLADES permits normal expansion of bursting chips — MEANS MAXIMUM CUTTING EFFICIENCY.

Manufactured By

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Produced under License Issued by John Milton Luers Patents Inc.

HERE'S SCRAP METAL BALING AT *Top Production*

The Dempster-Balester, Model 275, is setting production records everywhere because it's built to deliver the high speed service that top production demands. On the Dempster-Balester, all points of strain are built oversize to withstand internal stresses beyond the normal needs of baling. The charging box is carefully squared and completely lined with ¾" abrasion plates from which all roughness and high spots have been machined off. This rugged, dependable machine delivers uniform, high density 275 pound bales that are easily handled from baler to furnaces. For complete information and illustrated literature write or wire today.

DEMPSTER BALESTER
TRADE MARK REG.

Photographs show a Dempster-Balester Model 275, with loading pan, set in a pit for ground level loading. Above, top: Scrap being dumped in charging box by loading pan.

Above: View of hydraulically operated loading pan in dumping position. Left: Finished bale held in place by ejector while charging box door comes forward to push it off of the press. Bales are forced onto roller conveyor, then power conveyor hoists them into railroad cars.

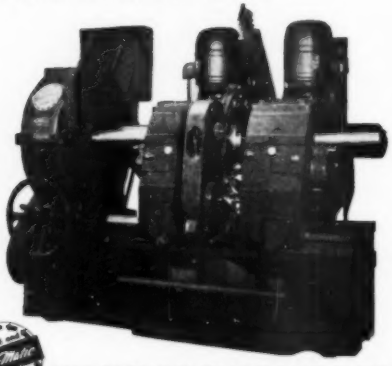
DEMPSTER BROTHERS, INC. • 419 DEMPSTER BLDG., KNOXVILLE 17, TENN.

Roto 1-A Matic

HORIZONTAL PRODUCTION MILLERS

FEATURING

1 CONTINUOUS OPERATION
2 AUTOMATIC CHAIN CLAMPING
3 ROUGH & FINISH CUTTERS — EACH HEAD
4 3 TYPES — VARYING BED LENGTHS
5 LOW MAINTENANCE COST
6 INTERCHANGEABLE FIXTURES



INDEPENDENTLY DRIVEN HEADS

No. 1-A ROTO-MATIC Millers have been produced for the past 30 years in various sizes and types to do specific jobs faster and better than they have ever been done before. Because of their flexibility they have been designed to take a wide range of work with uniform satisfactory results. Engineering has made possible the milling of several work pieces at one time giving a high production of each. In all cases exacting requirements as to quality of work have been met.

Chain Clamping Fixture for rough and finish milling both ends of Control Arm Trunions to length. Interchangeable buttons make possible the milling of several sizes — Production 296 gross per hour.

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Double Drum — 50 automatic holding fixtures on each drum for rough and finish milling radius on Rocker Arms — Production 1400 gross per hour.

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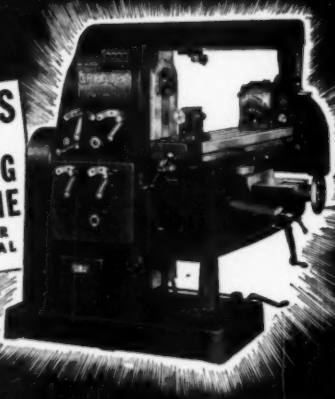
DAVIS and THOMPSON CO.
MANUFACTURERS OF *Machine Tools*
MILWAUKEE 14, WISCONSIN

BUILT RIGHT! PRICED RIGHT!

GREAVES No. 2-H MILLING MACHINE PLAIN OR UNIVERSAL



Simple in design. Easy to operate. Rigid construction including every worthwhile modern feature of milling machine development. With 18 spindle speeds (20 to 1000 R.P.M.) both the universal and plain millers are readily adaptable for heavy duty or light precision production work. Send for bulletin.

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The *Scleroscope* is the only hardness tester that takes in the entire range from the softest to the hardest metals without any adjustments.

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Points illustrated are standard.

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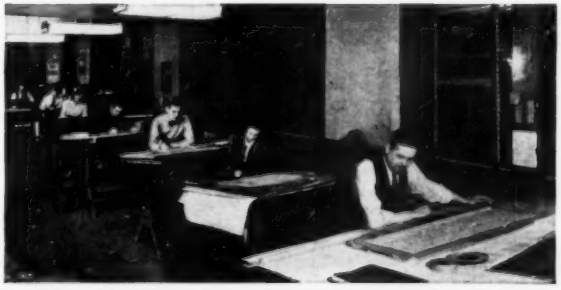
Knowledge gained in 43 years of cutting tool manufacture enables our Engineering Department to solve the most difficult machining problems of customers.



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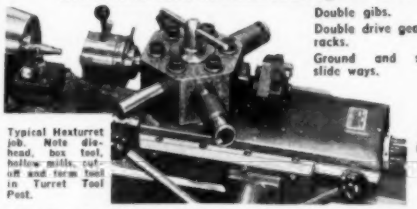

Double gibs.
Double drive gears and racks.
Ground and spotted slide ways.

Typical Hexturret job. Note die-head, box tool, hollow mills, cut-off and form tool in Turret Tool Post.

Clamps from top of ways.

Smooth and sensitive control with pilot wheel drive. Easy stop screw adjustment. All working parts hardened.

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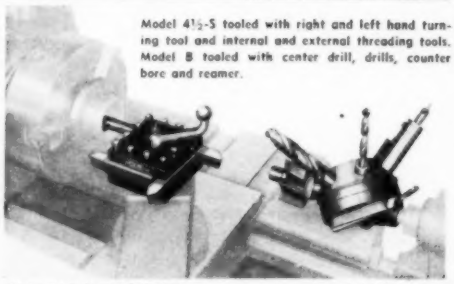

Model 4½-S tooled with right and left hand turning tool and internal and external threading tools. Model B tooled with center drill, drills, counter bore and reamer.

Model 4½-S Turret Tool Post. Model B Tailstock Turret.

ENCO TURRET TOOL POSTS FOR LATHES FROM 6" TO 42" SWING.
ENCO TAILSTOCK TURRETS FOR LATHES FROM 6" TO 20" SWING.

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Several widths of cutters can be used with each size miller and many different hole diameters keyseated with one tool through the use of eccentric bushings.

• Shops all over the country are solving difficult keyseating problems by chucking this attachment on their drill presses, radials and horizontal boring mills—and milling keyseats in pieces too large or bulky for convenient handling on keyseating machines.

The "National" goes through the hole once and mills keyseats with parallel sides and parallel with the axis of the bore. It's a big time and money saver and is available in standard stock diameters from ½" to 3½" for cutting lengths from 1⅞" to 12". It will keyseat in blind holes, and offset holes. We also manufacture oil-grooving millers.

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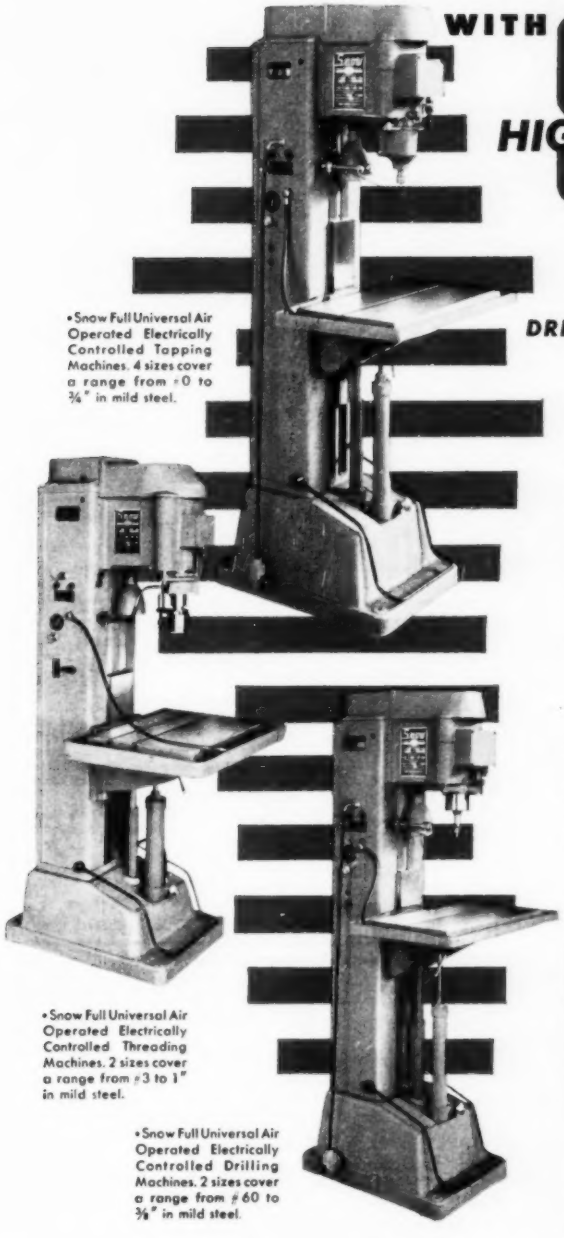
MEET SOARING PRODUCTION COSTS

WITH **SNOW** HIGH SPEED TOOLS!



• Snow Full Universal Air Operated Electrically Controlled Tapping Machines. 4 sizes cover a range from #0 to ¾" in mild steel.

• Snow Full Universal Air Operated Electrically Controlled Threading Machines. 2 sizes cover a range from #3 to 1" in mild steel.

• Snow Full Universal Air Operated Electrically Controlled Drilling Machines. 2 sizes cover a range from #60 to ⅜" in mild steel.

AIR-OPERATED ELECTRICALLY CONTROLLED DRILLING, TAPPING AND THREADING MACHINES

•Today's severe competition will be worse tomorrow. It cannot be met with yesterday's machine tools. The new Snow Full Universal Air-operated, Electrically Controlled Drillers, Tappers and Threaders are the answer for maximum production of small parts. •Typical of advanced design and amazing performance is the Snow Full Universal Drilling Machine (bottom left). Drill sets its own rate of feed for increased output and greater tool economy. In thousands of installations it has demonstrated capacities of 6000 pieces per hour. Numerous types of Snow air-operated indexing and clamping fixtures and jigs are available for instant synchronizing to the machines. Our engineers will gladly study your parts and blue prints and submit highly profitable suggestions. Send for data on *all* these Snow machines.

Snow

HIGH PRODUCTION DRILLING, TAPPING, THREADING, NUT TAPPING, 2 SPINDLE, HORIZONTAL MACHINES, DRILL PRESS TAP HEADS, JIGS AND FIXTURES

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BARRETT OIL EXTRACTION SYSTEMS

Reports from plants using Barrett Oil Recovery and Reconditioning Systems show surprisingly high percentages in increased tool life. Then, too, users are enthusiastic as to the improved condition of the reclaimed oil as well as the high returns on the investment. Some set-ups in plants engaged on defense production have paid for themselves in a few months.

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Barrett Centrifugal Oil Extractor—the heart of Barrett Cutting Oil Recovery and Reconditioning Systems.

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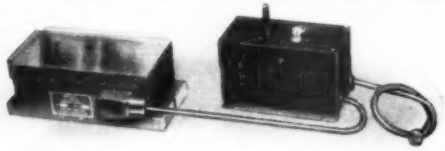
Designers and Builders of Centrifugal Machinery

NOW! MAGNETIC CHUCKING FOR SMALL TOOLS—BENCH WORK



Gives you all the advantages of magnetic chucking for your smaller machines—or for bench work. You'll get fast chucking—and save money by eliminating costly fixtures. Versatile for holding large and small parts on scores of jobs around the shops. Holds work to edge of face plate. Built for "wet" operation under coolants and cutting oils. MAGNA-LOCK Model HR510C has 5" x 10" working surface, is 4" high. Complete with separate rectifier, built-in switch. Simply plug into AC line and begin work! *Delivery 10 days.*

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☐ 110 volts ☐ 220 volts ☐ 440 volts
☐ My check for $98.50 enclosed. ☐ Complete details of HR510C chuck.
☐ Catalog of entire MAGNA-LOCK line.
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These parts are the main components of a turbo-jet engine. Millions of man hours — millions of dollars and the complete cooperation of American Enterprise has gone into their manufacture. Our part in the job was the design of machines, fixtures and broaches to do the major part of the metal removing. In the days ahead hundreds of plants will be affected by this program. So that you may know some of the facts about turbo-jet tooling we highlight some points from our progress report:—

1. *A Turbo-jet engine* is composed of three major sections — compression, combustion and turbine.
2. *Most metal removing* is in the compression and turbine sections.
3. *Blades, Buckets, Vanes, Rotors and Stators* are major components of these sections.
4. *Compressor rotors and turbine discs* are usually very tough metal and have about 60 to 90 blade slots.
5. *Compressor blades* vary in formula and have two major root shapes. Ball root and dovetail are the most common shapes.
6. *Buckets* are usually pine tree in root form and are a major tooling effort.
7. *Lapointe Machines* are available for all Turbo-Jet Broaching.
8. *Most tooling problems* have been worked out. Don't be afraid to enter this program.
9. *Contact Lapointe* for latest information before entering your bids.

HUDSON LAPOINTE MASS.

THE *Lapointe*

"Tooling for Jet Propulsion", a full color, 16 mm. sound film on Broaching is made available to Engineering and Mechanical groups. Write Dept. 71.

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Type "C" cutters are always perfectly aligned by tapered shanks and positively driven by hexagon heads. Either held by the friction of the taper or further secured by a threaded pilot, vibration and chatter are entirely eliminated.

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1. *Counterbores* in standard sizes from ¼- to 5-inch diameters, with pilots from ⅛ to 3; also standard countersinks and core drill cutters.

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3. *Special production cutters* in unlimited variety, some of them shown here—high speed steel and carbide tipped stepped and multi-diameter cutters, reamers, hollow mills, form cutters, and their various combinations; also inserted blade cutters.

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the Gairing *all-purpose* tool holder

GAIRING TOOLS

To get acquainted with our various lines of standard and special end-cutting tools request our Condensed Catalog, listing our representatives throughout the U.S. and Canada.

SCHERR *aids to precision – production*

SCHERR MICROMETERS
have vernier reading to 1/10,000

at no extra cost, in 1", 2", and 3" sizes. This is right in step with modern demands for higher accuracy. Available in sizes up to 96". All Scherr micrometers offer these advantages: solid forged frames; easy reading graduations on thimble and vernier; longer life and more sensitive touch due to a burnishing process which compresses and polishes the surface of the thread; ratchet stop to control the measuring pressure, and decimal equivalent markings on frame or barrel. Prices, 1", as shown, $11. 2" (black frame) $9.50. 3", $10.25. Write for bulletin and order the micrometers you need now.

Measure depth easily with these DEPTH MICROMETERS

Made with 2½" and 4" base. Each instrument furnished with three interchangeable rods, to measure depth to 1", 2", or 3". With or without ratchet. A handy tool that can save its cost in a single precision job. Price, with ratchet, 2½", $10. 4", $11.25.

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Made in strict accordance with American Gage Design Committee specifications. Frames of Meehanite. Wide range of sizes, from .195 to 11⅝". With round or square gaging pins, solid anvil, extended anvil, etc. The last word in snap gages, and at most interesting prices. Write us for details—and also about the Scherr special service for trueing and setting worn gages.

Speed inspection with the SCHERR TOOL STAND

Cuts inspection time almost in half by freeing both hands of operator, and holding micrometer or snap gage in most convenient position. Also prevents body heat affecting tool readings. One of those small, inexpensive items worth many times its cost in saved time. Try a few—then order a quantity. Price, $7.50.

An invaluable inspection tool—the SCHERR MAGNI-RAY

Magnifies the work under inspection, floodlights it as well, and gives the immense advantage of "two-eye seeing." Thousands are serving large inspection departments, and on precision machines or critical toolroom operations. The lens is ground by experts for true magnification. Heavy base permits swinging lens to any position any height to 14 in. Three types—Model A, 3" lens, 1½x plus, $21.65; Model B, 3x plus, $29; Model C, 5" lens, 1½x plus, $34.

Write for details of these tools

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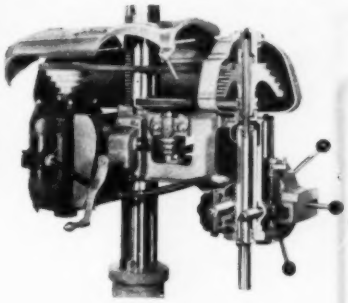
FOR EXAMPLE

Model D-1101X Power Feed. Price less motor and column $245.25
D-1100X Hand Feed. $170.00



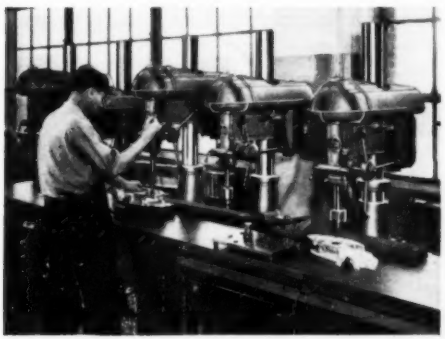
HARLEY-DAVIDSON PERFORMS 110 SEPARATE OPERATIONS WITH WALKER-TURNER 20" DRILL HEADS

Walker-Turner Light Machine Tools solve a dual problem for the Harley-Davidson Motor Co., Milwaukee, Wisconsin, in the production of their new lightweight model motorcycle. They fill the need for *standard* machine tools capable of handling approximately 110 *separate* drilling, tapping and spot-facing operations, and *eliminate the necessity for replacing expensive, special machines when models change.*

In set-ups devised by Harley-Davidson engineers, over 100 Walker-Turner Drill Heads machine motor, brake plate and crank-case assemblies. The equipment drills holes ranging from ⅛" to 1" in diameter at spindle speeds from 260 to 2600 r.p.m. When necessary, accuracy to .001" is attained. Both high-speed steel and carbide tools are employed.

Here again, Walker-Turner Light Machine Tools demonstrate their flexibility. Compact and rugged, Walker-Turner Light Machine Tools work *all* materials from wood and plastics through tool steel ... set new high production records ... give long, trouble-free service.

For complete catalog, write to Walker-Turner Division, Kearney & Trecker Corporation, Plainfield, New Jersey.



Photo, upper left: Progressive machining stages at Harley-Davidson: multiple drilling, tapping and spot facing done entirely on set-ups of Walker-Turner 20" Drill Presses.

Photo, lower left: Facing internal hubs of cast aluminum. Facing tools are mounted in standard Walker-Turner 20" Drill Presses.

**Photo, upper right:* 20" Power Feed Drill Press Head, Model D-1101X, Hand Feed Model D-1100X. 4 ball bearings, 6" spindle travel. Five standard spindle speeds, 400 to 2600 r.p.m. with 1740 r.p.m. motor. Capacity 1" in cast iron, ¾" in steel..... Slo-speed motor optional.

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RADIAL SAWS • BAND SAWS—FOR WOOD OR METAL
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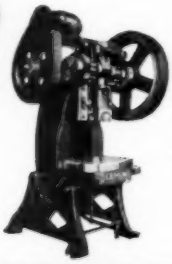
9 TON BENCH MODELS TO 56 TON GEARED PRESSES



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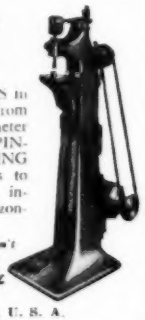

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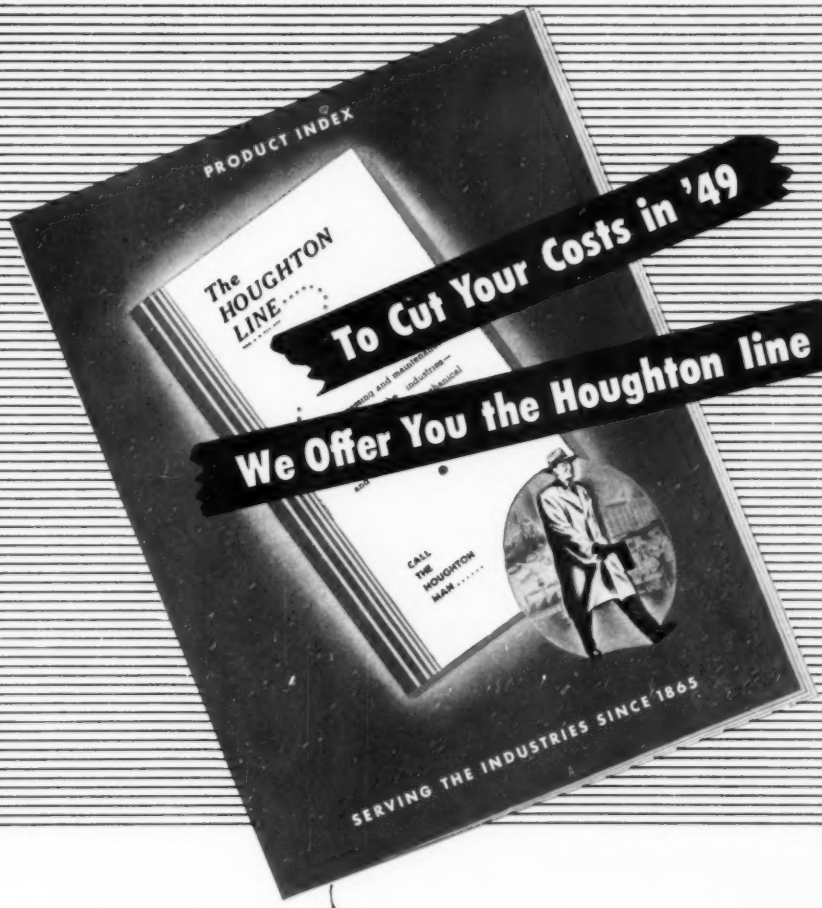

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American Machinist

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Mark of Antonius Stradivarius, Cremona, Italy . . . 1719

Mark of distinctive workmanship and quality

While both violins may look alike to the camera's eye, one is a rare instrument . . . the other, a clever copy. Actual comparison by a trained musician will show a vast difference in quality and value!

THERE IS A DIFFERENCE IN TAPS, TOO!

All taps may look alike at first glance, but the inherent, built-in quality of BATH ground thread taps is evident by their outstanding, every-day performance. Bath taps are ground from the solid AFTER hardening . . . are available in stock sizes or custom built for special uses.

For instance, if you're having trouble tapping stainless steel, there's a BATH tap, especially ground and engineered to speed production and decrease the threading cost of this hard-to-work metal. Why not investigate this special tap . . . or, write us about your particular threading problem today? Our experience is yours for the asking!

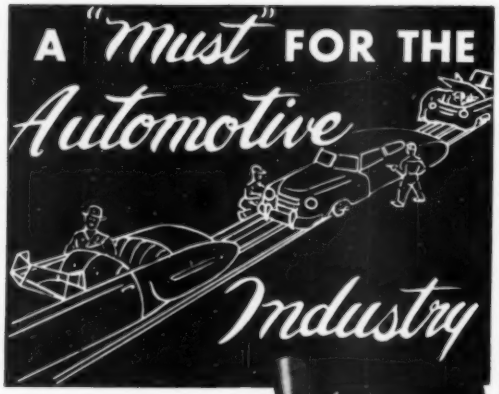
INSIST ON BATH TAPS . . . PROFIT BY THEIR PLUS-PERFORMANCE!

PLUG AND RING THREAD GAGES • GROUND THREAD TAPS • INTERNAL MICROMETERS

JOHN BATH CO. INCORPORATED

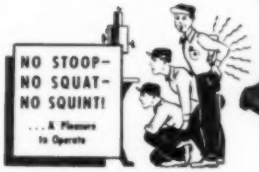
22 Grafton St., Worcester, Mass.

A "Must" FOR THE Automotive Industry



The OLIVER HEAVY DUTY ACE Cutter Grinder

OLIVER OF ADRIAN



The extreme accuracy demanded of tungsten-carbide cutters places an equal demand on the grinders used in their maintenance.

Oliver has kept pace with the evolution of the carbides as cutting materials, and the Heavy Duty Ace is specifically designed to perform efficient and accurate work on grinding the hard metals. It is a "must" in the automotive plants, where carbide cutters are basic. (It's easy to set-up, easy to operate).

There are many other Oliver products in use by automotive and other manufacturers, saving labor and cutting costs wherever introduced. They include Drill Pointers, Die Makers, Template Tool Bit Grinders, Face Mill Grinders and Drill Point Thinners in a variety of types and sizes to fit production needs.

It will pay you to investigate — send for literature covering products of interest to you

OLIVER INSTRUMENT CO.
1414 E. Maumee • Adrian, Michigan

IMPROVE YOUR TOOLROOM
IT'S THE BACKBONE OF PRODUCTION
OLIVER OF ADRIAN
AUTOMATIC DRILL GRINDERS
TOOL & CUTTER GRINDERS—DRILL POINT THINNERS—TEMPLATE TOOL GRINDERS—FACE MILL GRINDERS—DIEMAKING MACHINES

ABRASIVE SURFACE GRINDERS

EXCLUSIVE AGENTS

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Tidewater Supply Co., Inc.

ATLANTA 1, GA.
Childs, W. P.
845 Memorial Drive S. E.
P. O. Box 700

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Young & Vann Supply Co.
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Marshall & Huschart Machy. Co.
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Motch & Merryweather Machy. Co.
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Blackman & Nuetzel Machy. Co.

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ABRASIVE MACHINE TOOL CO.
EAST PROVIDENCE 14, R. I.

ABRASIVE
ACCURACY BOOSTS PRODUCTION

provide the newest and only outstanding improvement in Flexible Shaft Machinery in 25 years. It's another Strand step forward in quality precision tools for faster, easier and more economical production work. The Strandflex 4-Speed gear drive employs a patented, new type of quick change gear drive utilizing 4 POSITIVE speeds by a unique and easy method of instantly changing from one speed to another. Powered with totally enclosed ball-bearing motors (having speeds from 850 to 9000 R.P.M., depending on motor) means years of smooth, trouble-free service. Send for Bulletin No. 43-A for full details.

Standard 3 speed counter shaft type Strand machines also available for portable rotary power at constant speeds for grinding, buffing, drilling, wire brushing and rotary filing, in all types and models from $\frac{1}{8}$ to 3 H.P.—for every specific requirement. Send for Catalog No. 30.

Distributors in all principal cities

Strand
N. A. STRAND & CO.
5001 NO. WOLCOTT AVE.
CHICAGO 40, ILL.

cleaning we can talk till we're

blue in the face

OAKITE MATERIALS
for Better Metal-Cleaning

OAKITE COMPOSITION NO. 97 for machine pre-cleaning before pre-paint treatment; electrocleaning: Dissolves, removes buffing, drawing compounds. Details in Report 8153

OAKITE COMPOSITION NO. 92 for steam cleaning: Detergent action removes grease and dirt quickly. No toxic vapors. Free-rinser. Details on request.

OAKITE COMPOSITION NO. 90 for electrocleaning: Wets, emulsifies, loosens dirt and oils. Fine bubble blanket traps troublesome spray. FREE data on request.

OAKITE COMPOSITION NO. 3 for burnishing: Superior lubrication; thick suds; free rinsing. Facts on this and barrel cleaning in FREE Report 6705.

OAKITE CRYSCOAT to condition ferrous metals for paint, lacquer: Thoroughly removes soils, leaves inert phosphate film that holds paint. Details in FREE Report 6731.

FREE OAKITE SERVICE REPORTS!
Check those you want. Clip and send with your name and address to
OAKITE PRODUCTS, INC.
30H Thames Street, New York 6, N.Y.

We could use up a lot of words telling you how good Oakite cleaners are. How much money you stand to save using Oakite cleaning methods. How many benefits Oakite in-plant service gives you.

And we could brag about our free informative literature, our free blueprints for building and installing modern cleaning equipment. We could mention the fact that we issue, on loan, various controllers for maintaining proper cleaning solution strength and temperature . . . that we supply our customers with dispensing devices to help stretch cleaning supplies.

We could tell you that we've been in this cleaning business for nearly 40 years. We could tell you all these things – and be telling the truth. But words are cheap; that's why we'd rather act than talk. Let us prove, on your tough or routine cleaning problems, that our actions speak louder than words.

Technical Service Representatives in Principal Cities of U. S. & Canada

MATERIALS
METHODS
SERVICE

OAKITE
REG. U. S. PAT. OFF.

Specialized Industrial Cleaning
MATERIALS • METHODS • SERVICE

One of a series *of messages to help you increase your understanding of business paper advertising, and its effect on your job.*

Does your advertising manager rate an invitation to the management table?

IF YOU SHOULD ASK *him*, he'd probably say "yes." And his reasoning might run something like this:

Management's first responsibility is to show a fair profit. This requires a relentless search for continued improvement – in design, in purchasing, in production, research and cost-accounting. Each deserves its place at the management table. Yet none of these activities can actually create a dollar of profit, for the simple reason that you can't *produce* anything at a profit – not unless you can also *sell* it.

And that's what makes the advertising manager's job so important.

His first responsibility is to see that your company's products are made familiar (and desirable) to the greatest number of prospects, at the lowest possible cost. In fulfilling this responsibility, he sets a parallel course with the sales department, although his approach more closely resembles that of the assembly line technician.

For advertising, as he sees it, is simply the application of assembly line techniques to the *manufacture of a sale*. Just consider the five basic steps involved:

1. **Seeking out prospects**
2. **Arousing their interest**
3. **Creating a preference for your product**
4. **Making a specific proposal**
5. **Closing the order**

By *mechanizing* the first three of those steps, advertising increases management's chance to show a profit. It leaves your salesmen free to concentrate on the two jobs which they alone can do, and do best.

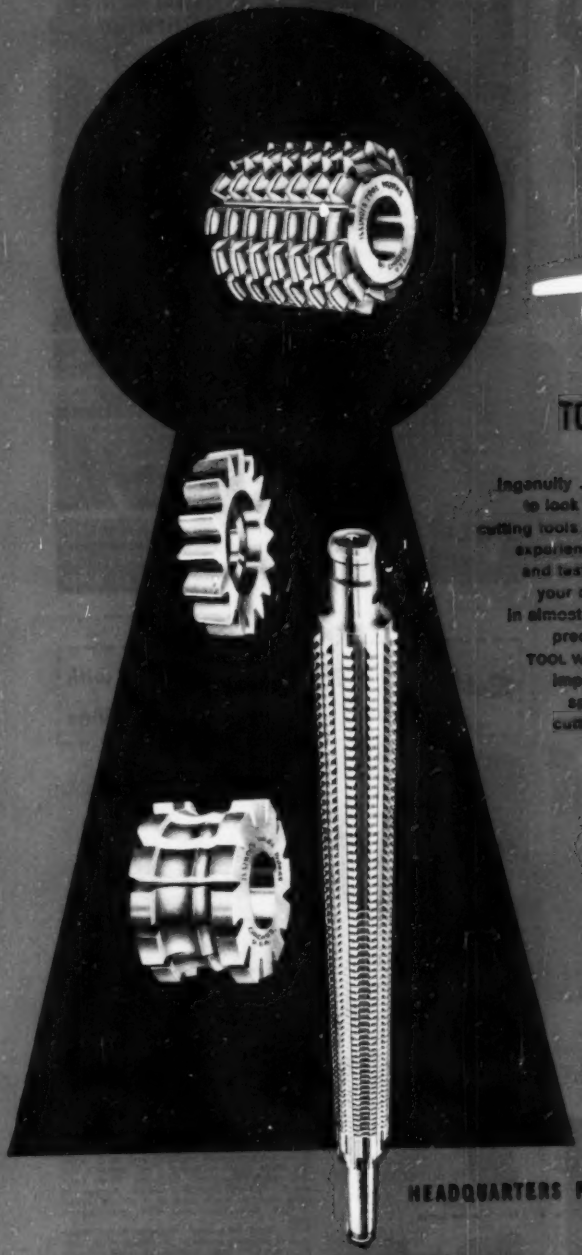
And nowhere does this mechanizing process operate more efficiently than in the business press, where it reaches your best prospects at the lowest possible cost.

Perhaps that's why so many smart advertising managers are partial to business paper advertising – and why more of them, incidentally, are getting to sit at the management table!

THE ASSOCIATED BUSINESS PAPERS

205 East 42nd Street, New York 17, N. Y.

ABP's BUSINESS IS TO BOOST YOUR BUSINESS



the key

TO CUTTING TOOL EFFICIENCY

Ingenuity . . . Skill . . . Experience—these are the qualities to look for in selecting your source for precision metal cutting tools. At ILLINOIS TOOL WORKS, master tool makers and experienced tool engineers, working with modern production and testing equipment, place these vital intangibles at your disposal. For more than thirty-seven years . . . in almost every major metal working industry from precision bearings to giant turbines . . . ILLINOIS TOOL WORKS has cooperated in reducing costs and improving quality through the development of specialty engineered cutting tools. Bring your cutting tool problem to "Headquarters" . . . our engineers are at your service!

ILLINOIS

TOOL WORKS

2501 North Keeler Avenue, Chicago 39, Illinois
In Canada: Canada Illinois Tools, Ltd., Toronto, Ontario

HEADQUARTERS FOR ENGINEERED CUTTING TOOLS

THE GLOVE THAT KEEPS COMING BACK FOR MORE

JOMACS OUTWEAR ORDINARY WORK GLOVES BY AS MUCH AS 700%... SHOP RECORDS PROVE IT!

As much as *700% more wear* than from ordinary work gloves—that's what you get when you use JOMAC Gloves. Proved in shops where long glove-service is a must, JOMAC Gloves will give you outstanding glove-economy, plus performance that can't be touched by ordinary work gloves.

JOMAC Gloves can be washed or dry cleaned repeatedly, and used again and again. They have unusual flexibility, which permits complete hand-freedom and assures a quick, firm grip every time. These remarkable gloves are made from the original Jomac fabric, a tough, loop-finished cloth with hundreds of "air-cell" cushions held securely in place by hidden lock-stitches.

Try JOMAC Gloves in your shop. Keep a record of their performance. You'll need no better proof of our statement that JOMAC Gloves give up to 700% more wear than ordinary gloves. For full details, write C. WALKER JONES CO., 6139 North Lambert St., Philadelphia 38, Pa. Plants in Philadelphia, Pa., Detroit, Mich., and Warsaw, Ind.

Foreign Representatives: Gillespie & Co. of New York, Inc., 96 Wall St., New York 5, N. Y.

"SHAKE HANDS WITH SAFETY"

JOMAC INDUSTRIAL GLOVES

THREE TYPES OF JOMAC GLOVES

REGULAR INDUSTRIAL TYPE • HEAT- AND FLAME-RESISTING

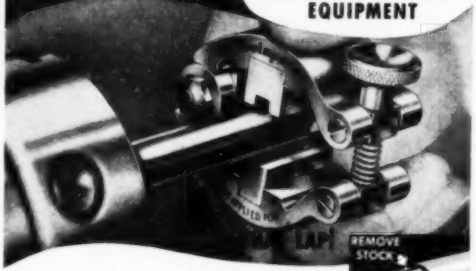
SAFETY GAUNTLET-CUFFS

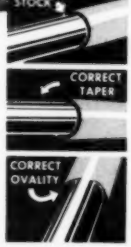
It's Come to America Now!

Delapena

PAT. APPLIED FOR

EXTERNAL HONING EQUIPMENT





No more need for costly lapping. Instead, use this inexpensive method of honing to exact size. Abrasive element removes stock, corrects ovality or taper, produces micro-inch quality finish. Accurate size on any material from turned or ground surface. Very simple, fool-proof, trouble-free design; no specialized skill or lengthy training required (just move the hone back and forth over the revolving surface). Four sets cover range from 1/16" to 1" diameter.

Ask for Bulletin 300-A

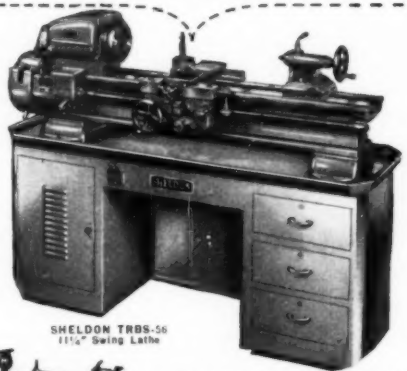
Delapena

Exclusive Sales Representatives in U. S. A.

MOTCH & MERRYWEATHER MACHINERY CO.

PENTON BUILDING • CLEVELAND 13, OHIO

Replace those off-size "war babies" with modern SHELDON *Lathes*



SHELDON TRDS-56
11¼" Swing Lathe

TU-1248P
13⅜" Swing Lathe

L-46
10⅛" Swing Lathe

5 years ago you took what you could get and did a job with it. Today you can get better lathes that will lower costs while increasing output.

With every increase in labor and other costs, the losses from operating "war babies" and antiquated "clunkers" increases. With modern SHELDON Precision Lathes you can do more accurate work, and do it faster, easier in less floor space and with lower power cost.

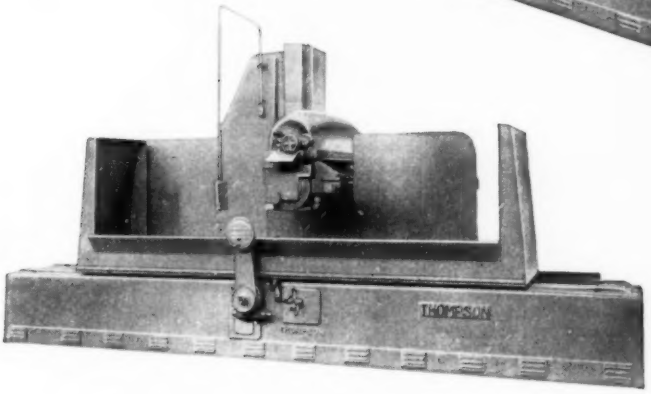
With "Zero Precision" Tapered Roller bearings a run-out accuracy of .00015, extra collet capacity and modern 4-speed V-belt drives, these moderate priced lathes will work to the closest tolerances and hold their accuracy under continuous, full speed, full capacity operation.

SHELDON MACHINE CO., Inc.

4234 N. KNOX AVE., CHICAGO 41, ILLINOIS, U.S.A.

BIG THOMPSONS for BIG SAVINGS

in Surface Grinding year after year!



EXAMPLE NO. 1

Above—Thompson Heavy Duty Type CX 30" x 48" x 196" Hydraulic Way Grinding Machine with auxiliary vertical spindle for grinding safety gib, clamp surfaces and rack seats on machine bed. Working capacity of horizontal spindle, 240". Bed length 46 feet.

EXAMPLE NO. 2

At left—Thompson Heavy Duty Type CX 36" x 48" x 120" Hydraulic Surface Grinder. Equipped with super precision spindle powered with 40 H.P. motor.

The only manufacturer of a *complete* range of heavy duty and light duty surface and contour grinders for industry!

Write for new general catalog

Thompson SURFACE Grinders

The Thompson Grinder Company, Springfield, Ohio

Copyright 1948—The Thompson Grinder Co.

CARLTON RADIAL DRILL

FEATURES: 1. Low Hung Drive to Spindle. 2. All Power Driven Parts Running in Oil. 3. Quiet Running at all Speeds. 4. Concentrated and Convenient Push-button Controls. 5. Constructed on Unit Principle.

THE CARLTON MACHINE TOOL COMPANY

CINCINNATI 25, OHIO, U. S. A.

"SAVES $600 a year in shipping room," say users of Marsh Stencil Machines. Brushes, Inks! Electric and Hand Operated machines cut ½", ¾", 1" letters. For sample stencil, Shippers' Handbook, prices, pin this to business letterhead with your name.

MARSH STENCIL MACHINE CO.
40 Marsh Building • Belleville Ill., U. S. A.

Only Reliable Products Can Be Continuously Advertised

PRESSES • FEEDS
AUTOMATIC EQUIPMENT
The VED Press Company
HUDSON, NEW YORK

You Can Cut Off Tubing With One Finger!

ETNA

Tube Cutoff Machine

THE TUBE REMAINS STATIONARY . . . IT'S THE CUTTER HEAD THAT ROTATES

The entire cutoff cycle—clamping of tube, cutting off and unclamping is completely automatic.

SINGLE PUSHBUTTON CONTROLLED

What are you doing about tube cutting?

THE ETNA MACHINE CO.

3409 MAPLEWOOD AVE. • TOLEDO 10, OHIO

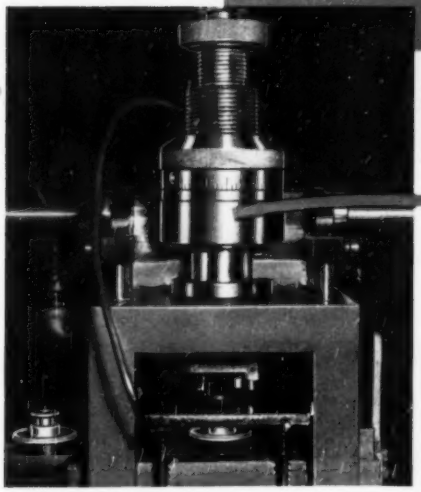
SECOMET DIAMOND

Here's a worth-while investment. Impregnated with carefully selected diamond grains of uniform size, insuring perfect finish with maximum efficiency, "Secomet" Diamond Wheels remove in the same time and at greatly reduced cost, five to six times the amount of carbides or hard metal that could be removed with a silicon carbide wheel.

Catalog on request.

J. K. SMIT & SONS, INC.
157 Chambers St., New York 7, N. Y.
6400 Tireman Ave., Detroit 4, Mich.
129 Adelaide St. West, Toronto, Ont.

GOT ANY DIFFICULT RECESSING JOBS?



Scully-Jones Standard Type "J" Automatic Recessing Tool with special circular form cutter; being used at Grigsby-Allison Co., Inc., Arlington Heights, Ill. on a small Delta Drill press, to cut external groove on a zinc die cast clutch gear, at a rate of 300 per hour.

Scully-Jones Standard Type "J" Automatic Recessing Tool. Types "J" and "C" are designed to pilot in a fixture bushing and are used in drill presses and turning machinery.

Scully-Jones Standard Type "R" —size 2R Automatic Recessing Tool. Sizes 2R, 4R and 5R pilot in the hole or stop on the face of the work and are used in drill press, automatic screw machine or turret lathe operation, or in setups where it is impractical to mount a pilot bushing.

Do Them Easily with SCULLY-JONES standard AUTOMATIC RECESSING TOOLS

(Three Types—Five Sizes)

You can do any of these with Scully-Jones Standard Automatic Recessing Tools: retainer ring grooves; reliefs for tapping, threading, grinding, honing; chamfers; second operations on cast or molded parts, or a combination of these operations.

DOWN go recessing costs —UP goes production

RESULTS THAT PAY

You get these results with Scully-Jones Recessing Tools:

1 Make many recesses with a single Recessing Tool, by merely changing tool bit holder or circular form cutter.

2 Operate on standard production machines—no costly special machines needed.

3 Maintain close tolerances—reduce rejects.

4 Get long life—low maintenance cost—as all parts are hardened and ground, and built to take severe punishment.

5 Speed up production—cuts costs, because tool operation is automatic.

Send For Details Today—No Obligation

Write on your company letterhead for a free copy of our new 28-page Manual No. 17-2. It gives you a clear picture of the application, operation, construction and many advantages gained by using Scully-Jones Automatic Recessing Tools.

Scully-Jones AND COMPANY

1902 S. ROCKWELL STREET, CHICAGO 8, ILLINOIS

0.2759

YOU GET LOW COST, FAST, ACCURATE PRODUCTION WITH OUR STANDARD AND SPECIAL TOOLS

★ When the chips turn blue, the air frequently does, too, for it means a high speed tool bit needs regrinding. But chips don't come up blue when the proper coolant is used . . . and the best way to get coolant to the junction between tool and chip is with a Pioneer Pump.

Pioneer Pumps are "blue chip" performers on all heavy duty or high finish operations. Milling, turning, drilling, sawing, reaming, tapping, hobbing, broaching or grinding . . . every operation and every machine will benefit from the steady, adequate flow of coolant supplied by Pioneer Pumps.

There's a "blue chip" performer to fit any machine in your shop . . . for Pioneer makes 400 standard models of the longest-lived pumps ever built.

PIONEER MODEL MVBD

Seal-less model designed to mount on outside of coolant tank or machine pedestal. Intake is through mounting pad hole, eliminating intake piping. Three outlets permit piping to right, left or back into the coolant sump. Will stay primed and function efficiently in shallow places out of the reach of most pumps.

PIONEER Pumps
HIGH EFFICIENCY • LOW POWER CONSUMPTION
GREATER VOLUME AND LESS MAINTENANCE

Pioneer Pump & Manufacturing Co.
19651 JOHN R ST. • DETROIT 3, MICHIGAN.

THE OLDEST NAME
in GRINDING LUBRICANTS
ECONOMY
REG. U. S. PAT. OFF.
THE W&B CO
. . . Preferred Today
BECAUSE OF OUTSTANDING PERFORMANCE THROUGHOUT THE YEARS

We can help you do better work, increase production, lower costs on your cutting and grinding operations.
Write for new bulletin 17.

THE WHITE & BAGLEY COMPANY
WORCESTER, MASS. • DETROIT, MICH.
Grinding and Cutting Lubricants, Grinding Oils
Spindle Oils, Sulphurized Fatty Bases

LINLEY

MILLER AND JIG BORER

Handles a wide variety of toolroom jobs with speed, accuracy, efficiency . . . die work, jig and model making, drilling, reaming, milling. Releases larger machines for work better suited to their capacities. Easy set-up, quick changeover . . . velvet-smooth feed, eight spindle speeds from 275 to 4250 rpm. . . simple, direct micrometer setting.

FOR COMPLETE INFORMATION, WRITE FOR BULLETIN.

LINLEY BROTHERS CO., 664 STATE ST. EXTENSION BRIDGEPORT 1, CONNECTICUT

SUPREME ACHIEVEMENT IN HIGH SPEED STEELS

VASCO SUPREME

U. S. PATENT NO. 2174285

a new cutting material

helping industry cut costs by increased tool performance

Performance results show tool life of Vasco Supreme exceeds that of tools made from ordinary High Speed Steels up to five times or more in the machining of plastics, brass, malleable and cast iron, cast and heat treated steels. These results are being obtained from all types of tools including turning and boring tools, milling cutters, hobs, broaches, drills, taps and reamers.

In addition to better tool life the properties of Vasco Supreme make possible increased speeds of 15 to 100% in many instances.

For cost cutting performance let us demonstrate the qualities of this new and revolutionary tool material!

Manufacturers of *First Quality* TOOL and DIE STEELS —exclusively

Vanadium-Alloys STEEL COMPANY

COLONIAL STEEL DIVISION • ANCHOR DRAWN STEEL CO.

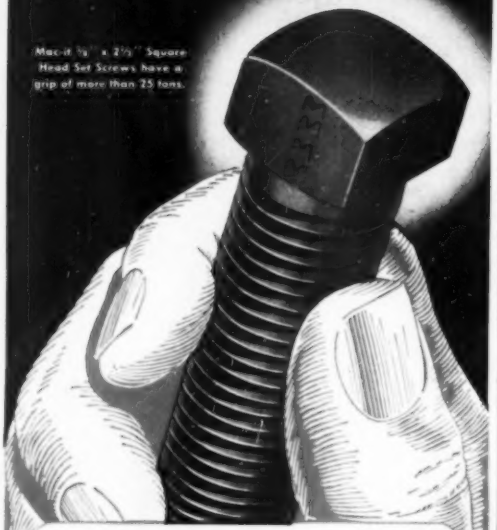
LATROBE, PENNSYLVANIA

IT'S A

Mac-it ®

PRONOUNCED "MACK-IT"

Mac-it ½" x 2½" Square Head Set Screws have a grip of more than 25 tons.



BETTER, FASTER SERVICE WITH THIS *COMPLETE* MAC-IT LINE!

Because many standard types of Mac-its are stocked throughout the country for quick delivery, and because specials can be engineered to your own specifications, you'll find it pays to investigate Mac-its *first.*

Mac-it's 35 years' experience in the manufacture of heat-treated, alloy steel screws is your assurance of precision, uniformity and strength. Sold through leading industrial distributors from coast to coast and in Canada. Write for new catalog today!

Other Mac-it products include:

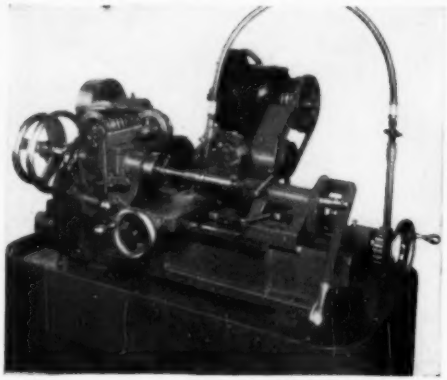
Hollow Lock Screws	Hollow Pipe Plugs
Socket Head Cap Screws	Socket Screw Keys
Hollow Set Screws	Hexagon Head Cap Screws
Stripper Bolts	. . . and many others

Marketed Nationally Since 1913 by

STRONG, CARLISLE & HAMMOND COMPANY

Cleveland 13, Ohio

Manufactured by MAC-IT PARTS COMPANY, Lancaster, Pa.



WALTHAM THREAD MILLING MACHINES

. . . for producing accurate, fine-finish threads on small diameters at low cost

This NEW model is mounted on a welded steel base in which are accessibly located control panel, coolant motor and pump. It is equipped with separate motors for cutter, work and coolant. Motor push buttons are conveniently placed.

Swing over carriage is 3" and work 2" diameter or smaller can be handled. Threads 8¾" long can be cut with work held on centers.

Special attachments are available for extending the utility of this machine. *Illustrated literature available on request.*

WALTHAM MACHINE WORKS

HIGH STREET WALTHAM, MASS.

BROACH YOUR *Small Parts* AT A NEW LOW COST with the

Zagar "S.P."

HYDRAULIC BROACHING MACHINE

WHY take chances with obsolete methods. Maintain accuracy and finish . . . and produce all around better work on a compact, powerful and inexpensive Zagar Broaching Machine. Maximum capacity 12,000 lbs., variable speeds 30' per minute maximum with 20" stroke. Weighs hardened and ground with adjustable gibs. Low *Initial Cost* and *Minimum Maintenance* make the Zagar Broaching Machine a *Profitable Investment* for any plant regardless of size.

WRITE TODAY FOR CATALOG No. AM-1A

Zagar

ZAGAR TOOL, INC.
23880 Lakeland Blvd. • Cleveland 23, Ohio

PRODUCTION TOOLING FOR INDUSTRY

FOR THOSE WHO ARE INTERESTED IN COMPACT, FLEXIBLE SPEED REDUCTION . . .

HERE'S THE NEW BOOK THAT GIVES THE ANSWERS

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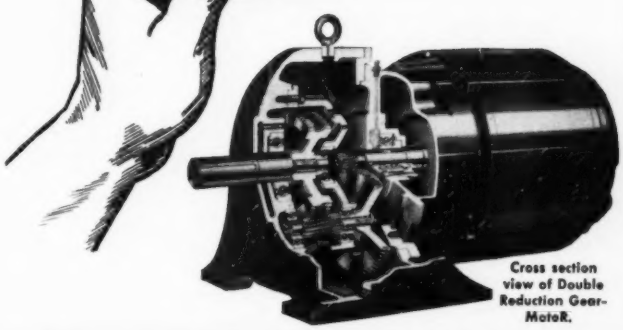

Cross section view of Double Reduction GearMotoR.

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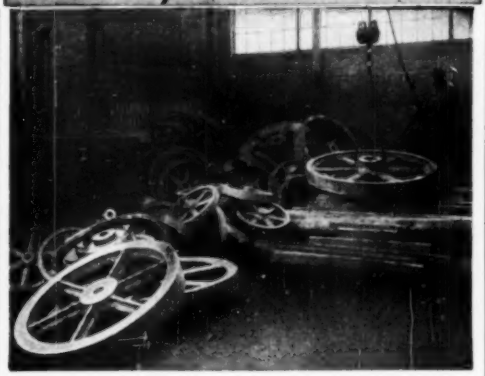

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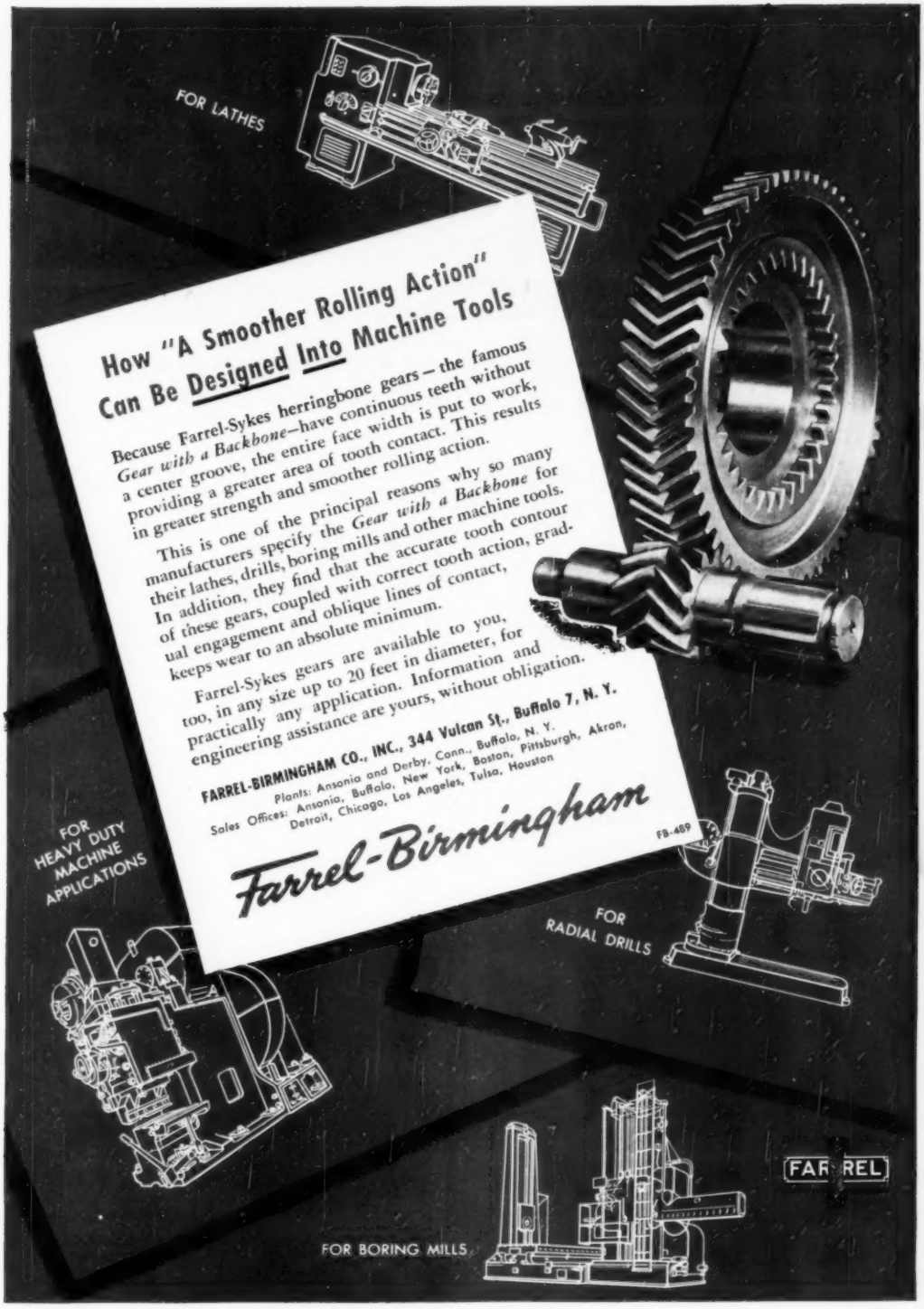
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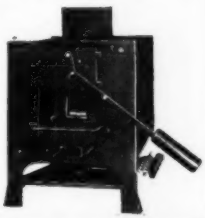

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6	1/4x 1/2	4.36	5.67	6	1/2x 1/2	6.50	8.45	6	3/4x1- 3/16	8.07	10.49
6	1/4x 9/16	4.36	5.67	6	1/2x 9/16	6.50	8.45	6	3/4x1- 1/4	8.07	10.49
6	1/4x 5/8	4.36	5.67	6	1/2x 5/8	6.50	8.45	6	3/4x1- 5/16	8.07	10.49
6	1/4x 11/16	4.36	5.67	6	1/2x 11/16	6.50	8.45	6	3/4x1- 3/8	8.07	10.49
6	1/4x 3/4	4.36	5.67	6	1/2x 3/4	6.50	8.45	6	3/4x1- 7/16	8.07	10.49
6	1/4x 13/16	4.36	5.67	6	1/2x 13/16	6.50	8.45	6	3/4x1- 1/2	8.07	10.49
6	1/4x 7/8	4.36	5.67	6	1/2x 7/8	6.50	8.45	6	3/4x1- 9/16	8.07	10.49
6	1/4x 15/16	4.36	5.67	6	1/2x 15/16	6.50	8.45	6	3/4x1- 5/8	8.07	10.49
6	1/4x1	4.36	5.67	6	1/2x1	6.50	8.45	6	3/4x1-11/16	8.07	10.49
6	1/4x1- 1/16	4.36	5.67	6	1/2x1- 1/16	6.50	8.45	6	3/4x1- 3/4	8.07	10.49
6	1/4x1- 1/8	4.36	5.67	6	1/2x1- 1/8	6.50	8.45	6	3/4x1-13/16	8.07	10.49
6	1/4x1- 3/16	4.36	5.67	6	1/2x1- 3/16	6.50	8.45	9	1/4x2		
6	1/4x1- 1/4	4.36	5.67	6	1/2x1- 1/4	6.50	8.45	9	1/4x2- 1/4		
6	1/4x1- 5/16	4.36	5.67	6	1/2x1- 5/16	6.50	8.45	*MAGNETIC CHUCK PARALLELS (Standard)			
6	1/4x1- 3/8	4.36	5.67	6	1/2x1- 3/8	6.50	8.45				
6	1/4x1- 7/16	4.36	5.67	6	1/2x1- 7/16	6.50	8.45	6	1/4x 1/2	PRICES FURNISHED ON REQUEST	
6	1/4x1- 1/2	4.36	5.67	6	1/2x1- 1/2	6.50	8.45	6	1/4x1-13/16		
6	1/4x1- 9/16	4.36	5.67	6	1/2x1- 9/16	6.50	8.45	6	1/2x1- 1/2		
6	1/4x1- 5/8	4.36	5.67	6	1/2x1- 5/8	6.50	8.45	6	3/4x1- 1/4		
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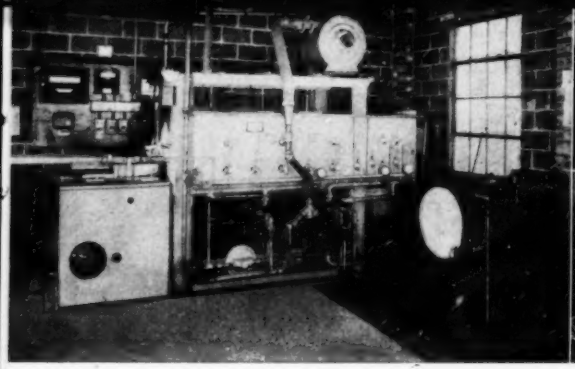

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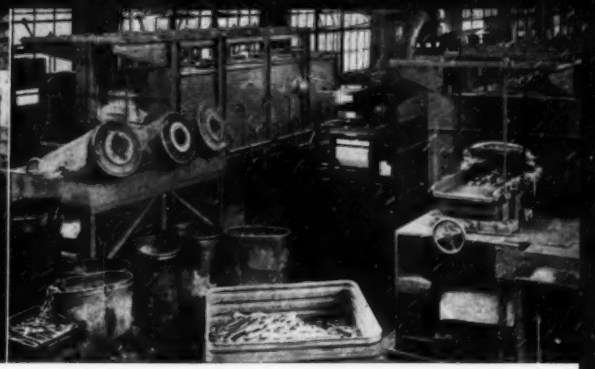

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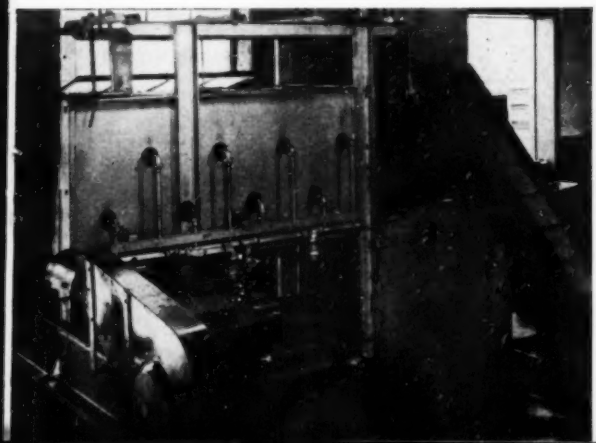

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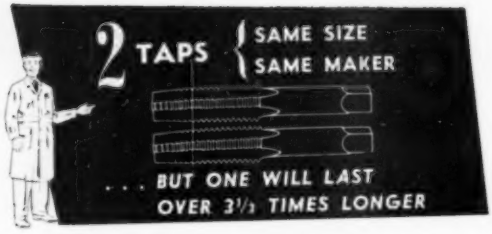

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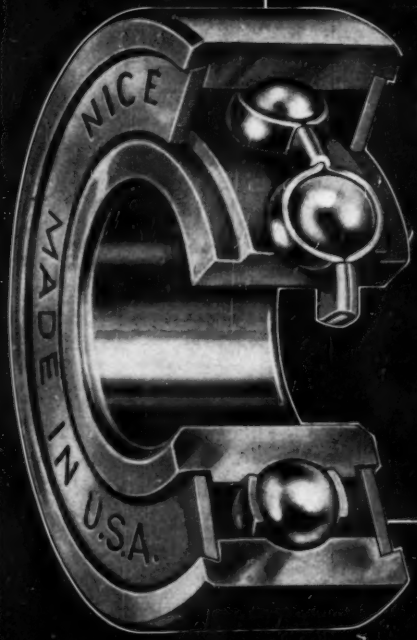

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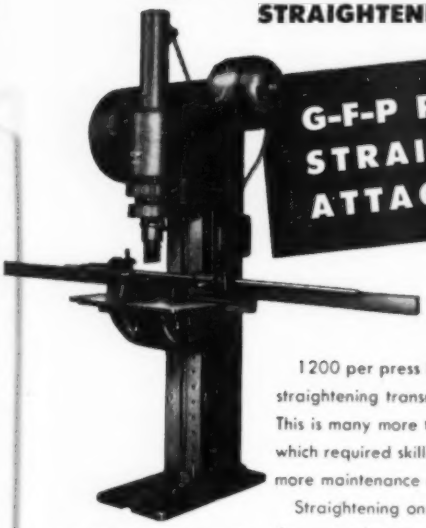

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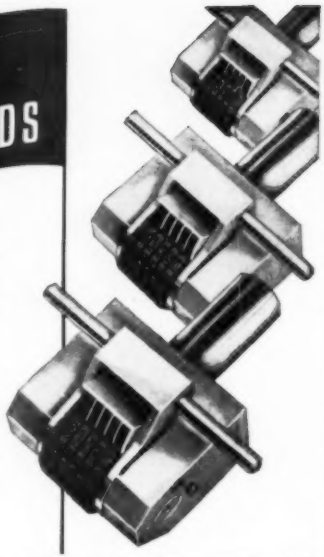

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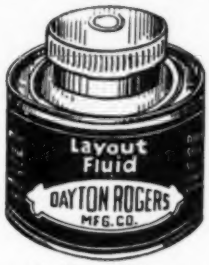

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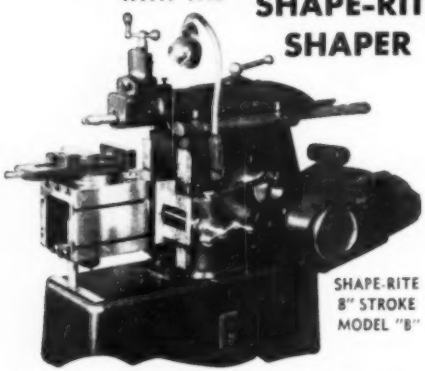

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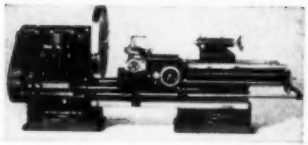

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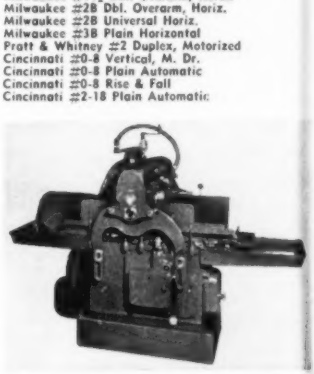
NEW Famco 36"x18 ga. Squaring
Niagara #8G Gap Squaring Shear. Cap.—96"x3/8". Motor driven. Front and rear gauges & extra set of blades. 18" gap.
Niagara #152 Squaring Shear. Cap.52½"x18 ga. Motor driven. Front gauges.

GEAR CUTTERS

Fellows #72 High Speed Gear Shaper, Internal & external, Motor driven
Fellows #7 High Speed Gear Shaper, External, Motor driven
Brown & Sharpe #3—36 Automatic Gear Cutter, 36" dia. Motor driven
Brown & Sharpe #34 Gear Hobber. 5" dia. Motor driven
Barber-Colman #3 Gear Hobber, 5" dia. 7" face, Motor driven
Whiton #1 Automatic Gear Cutter, 34" dia. 7" face, Motor driven
Adams #1 Gear Hobber, 14" dia. 6" face, Motor driven

MILLING MACHINES

Vernon #0 Hand, Late Type, M.D.
Nichols Hand, Late Type, M.D.
Sundstrand #0 Rigidmil, M.D.
Whitney #6 Hand, Cone Drive
Hardinge B.B. Vertical, Bench
Bickett #1 B.B. Vertical, Bench
Ames Universal Horiz. Bench
Becker #5C Vertical, Cone Dr.
Knight #1½C Vertical
Cincinnati #3 & #4 Vertical
Cincinnati #2 Univ. Horizontal
Cincinnati #3S Univ., Horizontal
Cincinnati #3, #4, #5 Pl. Horz.
Cinicnnati #2M Univ. Horiz.
Brown & Sharpe #12 Production. 18" Autom.
Brown & Sharpe #12 Production. 24" Autom.
Brown & Sharpe #0, 1, 1Y Horizontal
Brown & Sharpe #2 Univ. Horiz.
Brown & Sharpe #1D Univ. Horiz.
Brown & Sharpe #3 Univ. Horiz.
Kem psmith #1, #2 Plain Horiz.
Cincinnati 18" Mfg. Plain
Milwaukee #2K Vertical, M. Dr.
Milwaukee #3K Vertical, M. Dr.
Milwaukee #1½ Dbl. Overarm, Horiz.
Milwaukee #2B Dbl. Overarm, Horiz.
Milwaukee #2B Universal Horiz.
Milwaukee #3B Plain Horizontal
Pratt & Whitney #2 Duplex, Motorized
Cincinnati #0-8 Vertical, M. Dr.
Cincinnati #0-8 Plain Automatic
Cincinnati #0-8 Rise & Fall
Cincinnati #2-18 Plain Automatic



Cincinnati #2-18 Automatic Horizontal Milling Machine. Late Type, Motor driven with motor and controls. Motor driven coolant system. FIVE AVAILABLE.

SHAPERS & PLANERS

Shaper—Logan 7" Horizontal, NEW
Shaper—Machinery Sales 16", motorized
Shaper—Gould & Eberhardt 16", motorized
Shaper—Smith & Mills 16", motorized
Shaper—Smith & Mills 16" Universal
Shaper—Potter & Johnston 16", Universal
Shaper—Gould & Eberhardt 18" B.G. Crank
NEW—Gemco 20" Universal Shaper. M. Dr.
Shaper—American 24" crank, motorized
Shaper—Columbia 32" B.G. Crank. Gearbox
Planer—Shaper—Niles-B. Pond 20x20x24
Planer—Betts 72x60x30 Modern 4-Head
Planer—Betts 72x60x25 Modern 4-Head
Planer—Betts 122x72x34 Modern 4-Head

DRILLING MACHINES

American 8' Triple Purpose Radial, M. Dr.
Cinci-Bickford 6' Arm, 15" col. Radial
Cinci-Bickford 5' Arm, 13" col. Radial
American 4' Triple Purpose Radial, M. Dr.
Fosdick 5" Arm 14" col. Radial
Demco 4-Spindle Drill #2 M. T. M. Dr.
Natco #12, 20 Spdle. Multiple, 3/16" cap.
Minster #2D Single Spindle Upright Heavy Duty 2½" cap. Compound Table. Motorized
Canedy-Otto 21" Single Spdle. Late Type
Cinci-Bickford 21" Drilling & Tapping, #3 m.t.
Buffalo Forge #2MS Drill. Late Type
Barnes 22" Backgeared Upright Single Spdle.
Leland-Gifford #2MS, 2-Spindle Upright
Edlund #2B, 4-Spindle Upright, #2 m.t.
NEW Buffalo Forge #15, #18 Single Spdles.

HEADLINERS

NEW IN 1943-1944

16"x54" ctrs. AMERICAN "Pacemaker" Lathe, taper, collets, chucks
#1-18 CINCINNATI Plain Miller, backlash eliminator
#24-H GOULD & EBERHARDT Gear Hobber
10"x24" LANDIS Type C Univ. Grinder
24" CINCINNATI-BICKFORD "Super Service" Drill Press

LATHES

12"x30" MONARCH Model C Tool Room
14"x6' AMERICAN 12-speed Grd Hd, AC MIB, taper
14"x6' HENDEY Yoke Hd, Schulte Drive, univ. relieving attach.
14"x6' LODGE & SHIPLEY Selec. Grd. Hd., AC MD
14"x8' AMERICAN 12-speed Grd. Hd., AC MD, taper
15"x10' SEBASTIAN "Gold Seal" Grd. Hd., AC MD, taper
16"x6' SOUTH BEND, cone, quick change
16"x8' LODGE & SHIPLEY Selec. Grd. Hd., AC MD, taper
17"x8' LeBLOND Hvy. Duty, with AC MD
18"x8' LODGE & SHIPLEY, cone, quick change
20"x8' LODGE & SHIPLEY Selec. Grd. Hd., AC MIB, taper
22"x10' ROCKFORD 3 SCD DBG bowl hd.
24"x16' AMERICAN 12-speed Grd. Hd., AC MD, taper
24"x12' BOYE & EMMES, AC Turner Uni-Drive
24"x14' LODGE & SHIPLEY, Turner Drive, Taper
30"x16' LODGE & SHIPLEY, Lima Drive, taper

MILLERS

#1M CINCINNATI Rect. O/A Pl., AC MIB
#2 CINCINNATI H.P. Rect. O/A Plain, AC MIB, PRT, Timken
#2B MILWAUKEE Plain, AC MD, DOA
#2M CINCINNATI Plain, AC MIB, Timken, #50 spindle
#3 KEMPSMITH Univ., self-cont. AC drive, div. hds.
#3 CINCINNATI H.P. Plain, AC MD
#3B MILWAUKEE DOA Plain, AC MIB, PRT
#4 CINCINNATI H.P. Univ., Lima Drive, div. hd., slot attach.
#4B BROWN & SHARPE Plain, AC MIB, DOA, #50 spindle
6"x84" PRATT & WHITNEY Thread
6"x132" PRATT & WHITNEY Thread

SHAPERS & PLANERS

14", 24", 28", 32" GOULD & EBERHARDT High Duty
28" AMERICAN H.D., AC MD
30"x30"x8' CINCINNATI, AC MD
36"x36"x16' GRAY, AC MD, 4 hds.

DRILLS

#2 COLBURN Mfg.
#3 AVEY, AC MD, 12" OH
21" & 24" CINCINNATI-BICKFORD slid. hd.

RADIAL DRILLS

4' MORRIS, MD
6' CINCINNATI-BICKFORD mtr. on arm
7' DRESES, 17" col., AC MD thru gearbox

GRINDERS

#2 BROWN & SHARPE Univ., factory AC MD
#3 ABRASIVE Surface, AC MD
#4 GARDNER B.B. Disc, 23", AC MD
#72-A-2 HEALD "Sizematic"

BORING MILLS

#3A UNIVERSAL Horz. 3" bar, SPD
#31 LUCAS Horz., AC MD
#43 LUCAS Horiz., AC MD, 4½" bar, 20' betw. faceplate & outer support
38" KING Vert. Boring Mill, AC MD

GEAR MACHINERY

#1 ADAMS Hobber, AC MD
#18H GOULD & EBERHARDT Hobber, AC MD
#34 BROWN & SHARPE Hobber, AC MD
48" GOULD & EBERHARDT Cutter
#61 FELLOWS Shapers

TURRET LATHES

#4-W CINCINNATI ACME Univ., AC MD, thread chasing
#4 GISHOLT Univ., AC MIB, "Preselector", new 1942
#4 WARNER & SWASEY Univ. Grd. Hd., AC Mtr. in leg
#5 WARNER & SWASEY Univ. Grd. Hd., AC MD

MISCELLANEOUS

#4 WATERBURY-FARRELL Thread Roller, AC MD
2½" LANDIS Double Head Bolt Threader, AC MD
10" PRATT & WHITNEY Vert. Shaper
10'x16 ga. CHICAGO Steel Leaf Brake, AC MD
INGERSOLL-RAND XB2 Air Compressor, 888 cu. ft., AC MD
JACKSON Die Sinker
#642 NIAGARA Power Square Shear, 42"x12 ga.
6"x6" PEERLESS Univ. Shaping Saw, AC MD
9"x9" PEERLESS Hack Saw, AC MD gearbox
5½' x 16 ga. VERDIN KAPPES & VERDIN Press Brake, AC MD
2" LANDIS Pipe Machine
¾" LANDIS Bolt Threader, AC MD gearbox
36" TANNEWITZ Metal Cutting Band Saw, AC MD

YOUR INQUIRIES SOLICITED

COX MACHINERY CO.,
P. O. Box 1953 CINCINNATI 1, OHIO
OFFICE AND WAREHOUSE: 311-313 Bakewell St. Covington, Kentucky
Three minutes from the Cincinnati hotel district

THE R. A. VINE "Tolerance Tag" ON EVERY MACHINE
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Shows at a glance what each machine will do

LATE TYPE MACHINES READY FOR PROMPT SHIPMENTS

MILLS

No. 2 CINCINNATI Hi-Speed Dial Type Vertical
No. 4 CINCINNATI Hi-Power Vertical
No. 3V-G REED-PRENTICE Vertical with Duplicating Attachment
No. 2SP VAN NORMAN Horizontal
No. 4-48 CINCINNATI Duplex Hydro-matic
No. 33-1848 SUNDSTRAND Vertical "Hydro-Screw"
36" OHIO Production
No. 1-14 & No. 1-8 KENT-OWENS Production

GRINDERS

No. 3 CINCINNATI Centerless
No. 12 LANDIS Centerless—New
6"x18" CINCINNATI Cylindrical
LANDIS Type H 4"x18" Cylindrical
6"x18" THOMPSON Surface
No. 2 CINCINNATI Tool & Cutter, complete equipment
No. 6 BADGER D. E. Disc
No. 510 OLIVER Drill Pointer

LATHES

16"x30" MONARCH Type CC Tool Room
15"x6' SOUTH BEND Engine
14"x6' HENDEY Engine
12"x4' SEBASTIAN

TURRET LATHES

No. 8A JONES & LAMSON Universal, Saddle Type
No. 4 WARNER & SWASEY & GISHOLT Universals
No. EXXXXX 3 GISHOLT & MOREY Universals
No. 2 MOREY & SIMMONS Plain

MISCELLANEOUS

No. 401 CAMPBELL Cut-off Machine
2—No. 52 BLISS Presses
No. 310 CIMATOOL Gear Burring Machine
24" GEMCO Universal Shaper
20" CINCINNATI Universal Shaper
⅝" LANDIS 2 SPINDLE THREADER
1½" LANDMACO Internal Threader
Special 3 Spindle AVEY Drill—Radially Arranged Around Rotary Table
2 TURCHAN Followers—New
No. SH-12 BARNES Drill-Head
ROTOCLONE Dust Collector & Air Purifying Unit
30" Dia. HANCHETT Magnetic Chuck

Look for the Tolerance-Tag—and be SURE!
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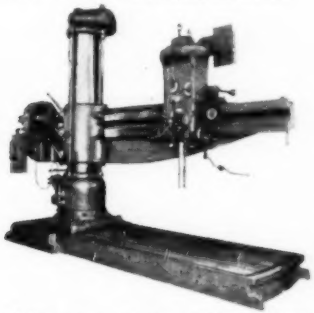
THE SIGN OF QUALITY
THE MARK OF DEPENDABILITY

EASTERN REBUILT MACHINE TOOLS

RADIAL DRILLS

3'-10" Fosdick Plain, gear box on base
3' American Sensitive, belt
4' American Sensitive, d.c. on arm
4'-13" American Triple Purpose, gear box
4'-12" Fosdick Plain, gear box
4' Niles-Bement-Pond Semi-Universal, m.d.
5'-13" American Triple Geared, gear box
5'-13" Cincinnati-Bickford, d.c. m.d.
5' Cincinnati-Bickford Full Universal, gear box
5' Cincinnati-Bickford Plate Hole Driller, m.d.
5' Prentice Plain, m.d.
6'-15" Carlton Plain, gear box
6' extended to 7'-15" col. Cincinnati-Bickford Plain, m.d.
6' Niles-Bement-Pond Semi-Universal, m.d.
6'-16" Western, m.d.
7' Dreses, 17" col., m.d.
8'-16" American Triple Purpose, d.c. m.d. on arm
8'-19" American Triple Purpose, d.c. m.d. on arm, p.r.t., 1942 machine
10'-22" American Triple Purpose, m.d. on arm



10'-22" column diameter AMERICAN TRIPLE PURPOSE PLAIN RADIAL DRILL

UPRIGHT DRILLS

20" Barnes Self-Oiling All Geared, m.d., tapper
21" Cincinnati-Bickford, m.d., tapper
24" Cincinnati-Bickford, belt, tapper
30" Rich H.D., m.d.
D4 Colburn H.D., m.d.
D8 Colburn H.D., s.p.d.
No. 25 Foote-Burt H.D., m.d.
No. 36 HO Baker H.D., m.d., 40" circular table
No. 217 Baker H.D.

GEAR SHAPERS

No. 61A Fellows, m.d., 1942 machines
No. 645A3 Fellows, m.d., 1945 machine
No. 6, 61, 645 Fellows, belt
No. 7, 7A Fellows, m.d.
No. 18 Fellows Gear Finishing Machine, m.d.
No. 615A Fellows, m.d.
No. 64-S Fellows, m.d.

GEAR GRINDING MACHINES

9" Pratt & Whitney Hydraulic Spur Gear Grinder, m.d.
10" Pratt & Whitney Spur & Helical, m.d.
No. 2HS Lees-Bradner Spur & Helical, m.d.
No. 13LS Fellows Gear Lapper, m.d.

VERTICAL MILLING MACHINES

No. 0B Cincinnati, m.d., latest
No. 2 Cincinnati H.S. Dial, m.d., latest
No. 2, 3, 4 Cincinnati H.P., m.d.
No. 2 Cincinnati Medium Speed Dial, m.d., latest
No. 2H Milwaukee, m.d., latest
No. 2HL Milwaukee Swiveling Head, m.d., latest
No. 2K Milwaukee, m.d., latest
No. 2M Cincinnati, m.d.
No. 2½B Milwaukee, m.d.
No. 3 Cincinnati High Speed Dial, m.d., latest
No. 3B Milwaukee, m.d.
No. 3K Milwaukee, m.d., latest
No. 3V Toledo, s.p.d.
No. 3V Van Norman, m.d., 1941 machine
No. 4 Cincinnati High Speed Dial, m.d., latest
No. 4 Milwaukee, m.d. in base, fixed head type, Timken
No. 4H Milwaukee, m.d., latest
No. 4K Milwaukee, m.d., latest
No. 5 Brown & Sharpe, cone
No. 5 Jackson, m.d.
No. 5 Reed-Prentice, m.d., 1941 machine
Cincinnati Hydromatic, with 2 vertical spindles mounted on rail
No. 6 Becker, cone

PLANERS

20"x20"x5' Whitcomb-Blaisdell, 1 head, belted m.d.
24"x24"x10' Whitcomb-Blaisdell, 2 head, belted m.d.
30"x30"x10' Gray, 2 heads, belt
30"x30"x14' Gray, 2 heads, belt
32"x32"x16' Gray, 2 heads, belt
36"x36"x10' Cincinnati, 3 heads, belted m.d.
36"x36"x10' Niles, 2 heads, belt
36"x36"x18' Niles-Bement-Pond, 2 heads, reversing m.d.
36"x36"x20' Cincinnati, 2 heads, belt
36"x36"x20' Gray, 2 heads, belt
38"x38"x20' Gray Spiral Drive, 2 heads, belt
42"x42"x26' Gray, 2 heads, belted m.d.
48"x48"x12' Gray Openside, 1 rail, 1 side head, reversing m.d.
48"x48"x18' Detrick & Harvey, 4 heads, reversing m.d.
48"x48"x28' Cincinnati, 4 heads, reversing m.d.
48"x48"x30' Cincinnati, 4 heads, belted m.d.
48"x48"x32' Niles-Bement-Pond, 4 heads, reversing m.d.
48"x48"x40' Sellers, 2 heads, reversing m.d.
62"x62"x40' Cincinnati, 4 heads, reversing m.d.
66"x60"x40' Niles-Bement-Pond, 4 heads, reversing m.d.
72"x72"x36' Niles, 4 heads, reversing m.d.
Type P10 Coulter Crank Type Shaper-Planer, 1 head, m.d.

MANUFACTURING TYPE MILLING MACHINES

No. 000 Brown & Sharpe, m.d., 1942 machine
No. 00 Sundstrand Rigidmill, m.d., late
No. 0B Cincinnati Model EA Automatic, m.d., latest
No. 0-8 Cincinnati Model EA Automatic, with rise & fall, m.d., latest
No. 12 Brown & Sharpe, m.d.
No. 1-12 Cincinnati Plain Automatic, m.d., late
No. 1-18 Cincinnati Plain Automatic, m.d., 1942
No. 2-18 Cincinnati Plain Automatic, m.d., with rise & fall, latest
No. 2-18 Cincinnati Automatic Plain, m.d., latest
No. 2-24 Cincinnati Plain Automatic, m.d., latest
No. 2 Sundstrand Electromill, m.d., late
No. 3A Sundstrand Copy Rigidmill, m.d.
No. 4-48 Cincinnati Plain Hydromatic, m.d., 1942 machine
No. 34-36 Cincinnati Duplex Hydromatic, m.d., with tracer control, late
No. 34-36 Cincinnati Plain Hydromatic, m.d., with Tracer control, 1944
No. 56-72 Cincinnati Duplex Hydromatic, m.d., 1942 machine
No. 56-90 Cincinnati Duplex Hydromatic, m.d., 1942
No. 33 Kempsmith Mfg., s.p.d.
Type P Ohio Mfg. Type, m.d.
Sunsdtrand Rigidmil, m.d., 18" rotary table
4" Pratt & Whitney Spline, m.d.
18" Cincinnati Mfg., m.d.
18", 24" Cincinnati Plain Automatic, m.d.
24", 48" Cincinnati Duplex Automatics, m.d.
Carter & Hakes Mfg. motorized
30"x36"x12' Ingersoll Slab, m.d., 2 heads
36"x24"x8' Ingersoll, m.d., 1 rail, 1 side head
48"x48"x20' Ingersoll Fixed Rail, equipped with 8 spindles
72"x6' Ingersoll Single Horizontal Spindle Traveling Housing Milling Machine, m.d., vert. movement 72", hor. movement 72"
96"x22' Ingersoll Single Spindle Openside Horizontal Traveling Milling Machine, m.d.

THREAD MILLING MACHINES

Hall Planetary, m.d., 6" cap.
4½x12", 6x14", 6x48", 6x80" Pratt & Whitney Thread
6x20" Type B Pratt & Whitney Thread, m.d.
10x24" Hanson-Whitney Thread, m.d.
CT-36 Lees-Bradner Thread, m.d.
CT-54 Lees-Bradner Thread, m.d.

PRESSES

Ferracute Double Crank, 36" between uprights, 84 tons cap.
Chambersburg 30 ton Hydro-Pneumatic, 13" stroke
No. 2V. & O., 1" stroke
B45 Metalwood Hydro-Pneumatic, 10 tons cap.
B33 Metalwood Hydro-Pneumatic, 15 tons cap.
400 ton Niles Wheel Press, 96" between strain bars

SHEET METAL MACHINERY

No. 2 Libert Nibbler, 28" throat
No. 1 Savage Nibbler, 34" throat, ¼" cap.
Southwark Rotary Metal Cutter, 36" throat, cap. ⅜"
Gray Turret Head Metal Cutter, 36" throat, cap. ½"
120" No. 100 Niagara Heavy Production Folder, cap. 16 ga.
10' Hilles & Jones Bending Rolls, m.d., top roll 11" dia. bottom rolls 9"

SLOTTERS

10" Newton, cone
12" Bement-Miles, var. speed m.d.
15" Canada, m.d.
20-24" Dill, m.d.
48" Niles-Bement-Pond Geared, reversing m.d.

TAPPERS

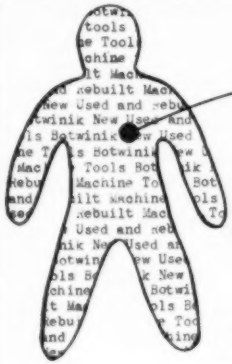
No. 1R Bakewell Precision Radial Tapper, m.d.
No. 1 Bakewell Precision, m.d.
No. 2 Bakewell Precision, m.d.
No. 5 Webster & Perks 5 spindle Vertical, cone
No. 10 Kaufman High Duty Oscillating Pneumatic, m.d.

MISCELLANEOUS

Gishalt Precision Balancing Machine, m.d.
40" Chip Wringer Tolhurst, m.d.
Cast Iron Bed Plate Size 84x120"
96" Ohio Extra Heavy Worm Feed Revolving Table, m.d.
No. 2 Cochran-Bly Filling Machine, belt
Detrick & Harvey 2 spindle Profiler, belt
No. 12M Morey 2 spindle Profiler, m.d., 1942 machine
No. 12 Pratt & Whitney 2 spindle Profiler, m.d.
No. 20PH A.C. Cook Deepwell Pump, driven by Chrysler Engine, new
No. 11, 11S Cochran-Bly Saw Sharpeners
Wagner Saw Sharpener, m.d.
16", 20", and 24" Cincinnati and Milwaukee Rotary Tables for milling machines, power feed
36" Cincinnati Power Feed Rotary Table, m.d.

We carry an average stock of 2,000 machines in our 11 acre plant at Cincinnati. Let us quote on your requirements.

THE EASTERN MACHINERY COMPANY
1004 Tennessee Avenue, Cincinnati 29, Ohio — MElrose 1241
CABLE ADDRESS EMCO



FIT THE MAN IN YOUR SHOP!

Analyze his needs — then select the proper guaranteed machine tool from Botwinik's huge stock.

LATHES

Niles Bement Pond 48"x24' G.H. Eng. Lathe; dist btwn cents. 15'; mtzd carriage.

Hendey 24"x18' Yoke Head Eng. Lathe; dist btwn cents 12'; taper attchmt, MD.

Bridgeford 36"x36', 15 speed geared head eng. lathe; M.D., AC electrical equip; power rapid trav. to carr; compound rest; 2 steady rests; swing 38" over bed, 26" over carr; dist. btwn ctrs 48'; motorized apron and taper attchmts.

American 30"x24' Medium Pattern 12 speed, G.H. Eng. Lathe; dist. btwn cents 18'; swings 24"; 2 carriages.

BORING MILLS

Universal 4" bar Tri-Way Horiz. Boring Mill, #6 Morse Taper 24 spdle speeds, 8-300 RPM, rapid travers, 12" extra height, vernier attchts.

Universal 3-44 Tri-Way Boring Mill—4½" bar, M.D. Morse #6 taper; max. dist face plate to outer support 108"; power vert. feed to bd. 50"; max. dist. tbl. to cent of spdle 52½"; size of tbl. 46"x75" M.D.

Yoder #3A Hor. Boring Mill—latest type, (Equiv. to new) 3" bar—#5 Morse Taper—Bar Travel 24" distance to outer support 72".

PLANERS

1—Cin. 60"x48"x25' 4 hd. hypo Planer; dbl. housing.

Liberty 72"x72"x20' Double housing Planer (1942 mchs)—Two compound heads on cross rail—Two side heads—herringbone drive—Power rapid Traverse—motors and generator set—rail heads equipped with air power clapper box lifts.

Cin. 78"x56"x22' planer; two swivel heads on cross rail; two swivel side heads, rapid traverse, intermediate herringbone gear drive.

Putnam 84"x84"x40' Planer; revers MD and controls; 2 hds on cross rail; 2 side heads (just taken out of service).

HAMMERS AND FORGING MACHINES

1—1200 lb. Standard Nsby Co. acts. drop Hammer —2 yrs old.
1—4000 lb. Chambersburg.
1—National 7½" Upsetter.
1—Bradley 300 lb. hammer.

GRINDERS (All Late Type)

1—Mattison 14"x24"x60" High Power Hydraulic Precision Surface Grinder, complete with magnetic chuck.
Blanchard No. 11 and No. 18 High Power Rotary Surf Grinders.

RADIAL DRILLS

1—Cincinnati Bickford Super Service 6'19" col. (1942).
1—Cincinnati Bickford Super Service 5'13"
1—Cincinnati Bickford Super Service 4'13" (1943).

TURRET LATHES

1—Bardons & Oliver #3 Univ.—swing 15¾"; hole thru spdle 1⅞"; max. dist. turret face to spdle 24"; spindle speeds (2) 3 H.P. tot., 915 RPM and (2) 5 H.P. to 1,525 RPM.

1—W. & S. #3 Univ. Turret Lathe; late type sw. 15⅞"; hole thru spdle 1-27/32" complete with bar feed; collets.

1—Jones & Lamson #5 Ram type Univ.—hole thru spdle 3"; swing 21¼"; max. dist. turret to spdle nose 36"; spdle speeds 20 to 1,000.

Ingersoll 2 spdle., Openside, Planer-type Spline Miller.

This is only a partial listing — for complete information — write, wire or phone (WOrcester 6-5175)

Botwinik Brothers of Mass., Inc.
[illegible] ST. WORCESTER 1, MASS.

GRINDERS

No. 5 Brown & Sharpe Cyl. Plain, 1942.
6x18" Norton Type "C" Cyl. Plain, 1941.
6x30" Norton Type "C" Cyl. Plain, 1942.
10x18" Landis Type "C" Cyl. Plain, 1942.
12x36" Norton Type "C" Cyl. Univ., 1943.
14x72" Landis Cylindrical Plain, 1941.
No. 72A3 Heald Sizematic Internal Gr., 1942.
No. 2 Cincinnati Centerless Grinder, 1942.
No. 2 Cincinnati Univ. T & C Grinder, 1942.
No. 3 Barber Colman Hob Sharpener, 1943.
No. 3D Gardner—DE Polisher 5 HP—1942.

Shears — PRESSES — Brakes

No. 3013½ Hamilton—Single Crank Press.
No. 581½ Consolidated—125 Ton SC Press.
No. 150GT Chambersburg—150 T. SC Press.
No. 4S Rockford OBI Press—(New).
No. 131 Dreis & Krump Press Brake (New).
12'x¼" Cincinnati Shear—1946.
10'x3/16" Columbia Shear—1946.
10'x⅜" Niagara Shear.
72" x 14 Ga. Wysong & Miles Squaring Shear (New).
10" x 10 Ga. Wysong & Miles Squaring Shear (New).

DRILLS

No. 3MS—24" Leland Gifford Drill.
No. 2LMS—Leland Gifford Hyd. Drill, 1942.
No. 22 Colburn Production Drill.
4'-11" American Radial, 1942.
4'-9" Cincinnati-Bickford Radial, 1942.

SCREW MACHINES

Conomatic—1½"—4 Spindle, Screw Machine 1940.
Brown & Sharpe No. 4 Screw Machine.
New Britain Gridley No. 665 Chucker, 1942.
Bullard — Type 1 — 7" — 8 Spindle Vertical Chucker.

MILLS

36-72 Cincinnati Hydrotel, 1941.
No. 2K K & T Vertical Mill, 1943.
No. 5 Reed Prentice Vertical Die Sinker.
No. 3V Reed Prentice Vertical Mill.
No. 2HL K & T Plain Horiz. Mill, 1943.

MISCELLANEOUS

No. 74 Foster Piston Superfinisher
No. 92D Ace Spot Welder.
7" Ammco Bench Type Shaper.
No. 1 Bakewell Tapping Machine, 1943.
500 Amp. Lincoln Arc Welder.
500 Amp. Hanson Van Winkle Munning Anodizing Generator, 1943.
60" Niles Vertical Boring Mill.
No. 29U Williams & White Bulldozer, 1941.

LATHES

No. 16 LeBlond Heavy Duty Automatic, 1944.
16"x33" Fay Automatic, 1942.
14"x12" LoSwing—Model U Lathe, 1942.
No. 5 Gisholt Turret Lathe, 1943.
No. 3 Warner & Swasey Turret Lathe, 1942.
No. 2 Simmons Micro Turret Lathe, 1943.
13"x5' South Bend Tool Room Lathe, 1946.
10"x4' South Bend Tool Room Lathe, 1946.
No. 1L Gisholt Turret Lathes, 1942.

GEAR MACHINES

12" Gleason Straight Bevel Gear Generator.
No. 12 Gleason Gear Tool Sharpener.
Type D—Barber-Colman, 1942.
Type A—Barber-Colman, 1942.
No. 71 Fellows Gear Shaper.
No. 8M Fellows Red Line Tester.
3" Red Ring Gear Shaver.

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LOSWING 8x60" centers Latest Type
NILES 30x50' boring "Timesaver" Timken Latest
NILES 26x48" and 72" centers MD
NILES 10x100" centers Motor Drive
NILES 42x39' centers Motor Drive
NILES 48x87' centers boring and turning MD
NILES 72x59' centers boring and turning MD
PUTNAM 42x25' centers geared MD
SCHUMACHER & BOYE 24x158" centers geared Motor Drive

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GOSS & DeLEEUW 8" Automatic Chucker, 5 spindles
NEW BRITAIN #61, 6 spindle, 1⅛" cap., Latest

BORING MILLS—HORIZONTAL

CINCINNATI GILBERT 3½" Bar, Floor Type, Latest
DETRICK & HARVEY 4" bar, Floor Type
GIDDINGS & LEWIS #25, 2½" Bar, M.D.
HEALD 48A, 49 Single End Bore-Matics, Latest
LANDIS #35, 3½" Bar, Floor Type, M.D.
LUCAS #41, 3" Bar, Table Type, Latest Type
NILES BEMENT POND 3", 6" bar, floor type, M.D.
NILES BEMENT POND 8" floor type, M.D.
UNIVERSAL 3" bar, table type, high speed, latest

BORING MILLS—Vertical

PETTS 120" 2 swivel heads, AC, M.D.
BULLARD 61 Mult-Matic Mill, 2 heads, Motor Drive
BULLARD 16" 6 spindle, 8 spindle, Mult-au matic, Type D Single Indexing, Latest Type
BULLARD 36" Vertical Turret "Spiral Drive" Latest
BULLARD 36" Vertical turret side hd., New Era M.D.
COLBURN 72" AC, M.D., 2 swivel heads, PRT
KING 62" 2 swivel heads, PRT, M.D.
NILES 100" 2 Swivel Heads, PRT, M.D.

BROACHES

AMERICAN V-2, 6 ton Vertical, hydraulic, latest
CINCINNATI 1-30 Duplex Vert. Hyd., Latest
CINCINNATI 3-30 Duplex Vert. Hyd., Latest
La POINTE Model C.P.C. 5-36 Vert. Hyd., Latest

HEALD 75A, 72A3, 72A5, 74, 70A Internal, Latest
HEALD #72A3, 72A5 Internal "Gagematic", Latest
JONES & LAMSON 6x15, 8x18, Auto. Thread, Latest
PRATT & WHITNEY Contour, Latest
THOMPSON 6"x18" Auto., Round Broach, M.D.

GRINDERS—Surface

BLANCHARD #11—16 chuck, Latest Type
BLANCHARD #16—24" chuck, Motor Drive
DO-ALL Model G-7, 9"x26", Hyd., Latest Type
GALLMEYER & LIVINGSTON #35, 8"x24", Latest
HEALD #22, 12" chuck, Rotary, latest type
HEALD 25A, 16" or 20" Chuck, Rotary, Hyd., Latest
NORTON 6"x18"—Hyd.—Latest Type
THOMPSON 12x12x24 Type B Hyd., Latest
THOMPSON 12x12x40 Type B Hyd., Latest

LATHES—Engine and Mfg.

AMERICAN 36"x360" centers, 2 carriages, M.D.
BRIDGEFORD 36"x24' centers, 2 carriages, M.D.
JONES & LAMSON "FAY" 20"x2.5" Automatic, Latest
LEHMAN 16x30 hydratrol, Tinken, latest type
LODGE & SHIPLEY 18"x72" centers, M.D.
LOSWING 4x60, 4x84, 8x60, 8x108, 5x34" centers, latest
MONARCH 22x156" centers Model CM, 3 car, Tinken Latest Type
MONARCH 12x54" centers Tinken, Latest Type
MONARCH 10x20" centers, Model EE Tinken, Latest
MONARCH 12x200" centers, Tinken, Latest Type
MONARCH 24"x54" centers, geared, Motor Drive
NILES 42"x60", double head, M.D.
NILES 90x110 centers Standard Driving Wheel, M.D.
NILES 72"x72" centers, Boring and Turning, M.D.
NILES 30x50' Boring, Tinken, Latest Type
PRATT & WHITNEY 16x30" centers, Tinken, Latest
PRATT & WHITNEY 16x26" centers, Bench, Latest
PRATT & WHITNEY 16"x60" centers, geared, M.D.

CINCINNATI #3, 4, 5, Motor Drive
CINCINNATI 4-36 Hydromatic, latest type
CINCINNATI 0-8 Auto. rise and fall, Tinken, Latest
KEARNEY & TRECKER #3, 4 heavy, Tinken, latest
KEARNEY & TRECKER 12H, simplex, latest
KEMPSMITH #1 Maxi-Mill, Tinken, latest

MILLING MACHINES—Vertical

CINCINNATI 0-8 Tinken Bearing, Latest Type
CINCINNATI #2, 3, 4, Dial Type, Tinken, latest type
GORTON 3J Super Speed, Latest Type
KEARNEY & TRECKER #3H, Tinken, Latest
REED PRENTICE 3VG with or without Hydraulic Duplicator, Tinken Bearing, latest type

MILLING MACHINES—Thread

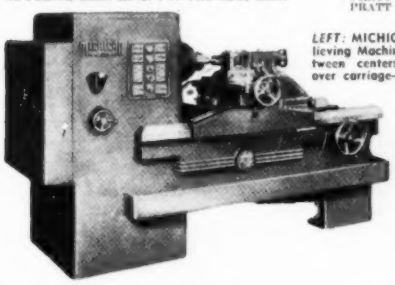
HANSON & WHITNEY 4"x9" centers, Latest Type
LEES BRADNER 12x24, Model HT, Latest Type
PRATT & WHITNEY 6x60" Type C, Latest Type
MOREY 12x30, 12x60, Latest Type

MILLING MACHINES—Universal

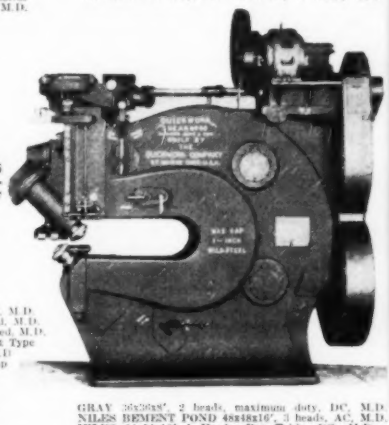
AMES 2½"x19" Table, Latest Type
BROWN & SHARPE #4A; Motor Drive
CINCINNATI No. 3 dial type, High Speed, Latest
CINCINNATI #3 Dial Type, med. speed; latest
HARDINGE Model UM, Tinken, Latest
KEARNEY & TRECKER #2 Heavy, Tinken, M.D.
KEMPSMITH #4 Maxi-miller, Tinken, Latest
VAN NORMAN #3, Duplex, M.D.
VAN NORMAN #12, #36, Tinken, latest type

PLANERS

DETRICK & HARVEY 48x48x16', 4 heads, Hyd.



LEFT: MICHIGAN #1708A Cutting, Relieving Machine. Maximum distance between centers—24". Maximum swing over carriage—8¼" Latest Type.



RIGHT: QUICKWORK #5 and #6 Rotary Shear. Capacity ¾" or 1", motor drive.

GEAR CUTTING EQUIPMENT

BARBER COLMAN #12 Hobber; motor drive
BARBER COLMAN Type S Hobber, Latest Type
FELLOWS Model Z Gear Shaper, High Speed, Latest
FELLOWS 61, 7A, 72, 75, 77, High Speed Gear Shapers, latest type
FELLOWS Type 6Z2 Gear Shaper, High Speed, Latest
FELLOWS #2D Lapping, Latest Type
GLEASON 3", 12" Straight Bevel Generator, latest
GOULD & EBERHARDT 12H, 12HS Hobber, Latest
GOULD & EBERHARDT #36H Hobber, M.D.
GOULD & EBERHARDT #6H with Differential, Motor Drive
PRATT & WHITNEY 10" Grinder, hyd., latest

PUTNAM 42"x25" centers, geared, Motor Drive
REED PRENTICE 16x24" centers, geared head, M.D.
REED PRENTICE 10x48" centers, Geared Head, M.D.
SCHUMACHER & BOYE 24"x15" centers, geared, M.D.
SPRINGFIELD 16"x30" centers, Tinken, Latest Type
SPRINGFIELD 14x15" centers Geared Head, M.D.
WARD HAGGAS & SMITH 18x36"x10' bed, Gap

LATHES—Turret

BARDONS & OLIVER #5, #7 Tinken, latest
CINCINNATI ACME No. 1, Latest Type
FOSTER 1FU, Fastermatic, Tinken, Latest
GISHOLT #3, 4, Univ., Tinken, Latest
GISHOLT #1L, #2L, Universal, Tinken, Latest Type
JONES & LAMSON #3, #5, Univ., Latest
POTTER & JOHNSON 5D, 5DZE, Tinken, Latest
MOREY No. 26, No. 3, No. 4 Tinken, latest
WARNER & SWASEY 2A, Univ., Bar & Chuck, with or without "TRE-SELECTOR", Latest
WARNER & SWASEY #2A, Univ., Tinken Bearing
WARNER & SWASEY #1A, Univ., Latest Type

MILLING MACHINES—Mfg.

INGERSOLL 42x28x12' Planer type, Adjustable rail, 4 heads, AC, M.D.
INGERSOLL 32x30x12' Planer Type Slab, AC, M.D.
INGERSOLL 32x24x16' Planer Type 2 heads, AC, M.D.
SUNDSTRAND Model 2A Duplex, Tinken, Latest Type
TAYLOR & FENN M-80 Duplex, Spline, Latest Type

MILLING MACHINES—Plain

BRIGGS Type A Hyd., 12" and 18" feed, Latest Type
BROWN & SHARPE #12, 24" feed, Tinken, Latest
BROWN & SHARPE 5B, Tinken, Latest
BROWN & SHARPE No. 2 Light Type, Tinken, Latest
CINCINNATI #4 Tinken Bearing, M.D.

GRAY 36x36x8', 2 heads, maximum duty, DC, M.D.
NILES BEMENT POND 48x48x16', 3 heads, AC, M.D.
NILES 54x54x18' 4 Heads, Table, DC, M.D.
SELLERS 30' Plate Edge, Motor Drive
WOODWARD & POWELL 54x54x20', 4 heads, DC, M.D.

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BIRDSBORO 325 ton, vert. hyd., Latest Type
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CLEARING Type DS 1125-32 dbl., action 125 ton,
CLEARING Type H-50-36-35 ton Vert. Hyd., Latest
FERRACUTE #DG-55, 75 ton drawing, Latest Type
HPM 37-ton Vertical Hydraulic, Latest
NILES 600 Ton Horiz. Wheel Press, M.D.

GRINDERS—Cyl.—Plain & Univ.

BROWN & SHARPE #1, 2 Universal, Latest
BROWN & SHARPE #5 Plain, 3x12, Latest Type
BROWN & SHARPE #30, 10x18 plain, latest type
CINCINNATI 16"x36", Plain, "Filmatic" Latest
LANDIS 6"x12", 8"x18" Type H, Plain, Hyd., Latest
LANDIS 6x18 Type C, Plain, hydraulic, latest
NORTON 6"x18", 6"x36", Type C Plain, Hyd., Latest
NORTON 10x72 centers Plain Type C Mech., Latest
NORTON 14x36" centers Plain Type C Hyd., Latest

GRINDERS—Misc.

BRYANT #5, #16-16, #16-CF-16, #24, Internal Hydraulic, Latest Type
CINCINNATI #2 Centerless, "Filmatic", Latest
CINCINNATI Centerless Lapper, Model ED, Latest
CINCINNATI "Moomer" Tool & Cutter, Latest
COVEL #22 Universal Tool & Cutter, Latest type
EXCELLO #40C Carbide, Latest
FITCHBURG 14"x25" Spline, Hydraulic, Latest
GLEASON #12 Tool Sharpener, Latest Type

MISCELLANEOUS

AJAX 1½", 3½", Bolt Heading, Upsetting and Forging
BARNES #172, 306H, 307 Vertical Hone, Latest Type
CAMPBELL #401 Abrasive Saw, Latest Type
CLEVELAND 12"x16" Cutter Reliever, Motor Drive
GROB #08-20 Band Saw & Filer, Latest
PELLOW #2 Nut Slotter, Latest Type
PRATT & WHITNEY "Keller" Type G, Type BL2416 Latest Type
PRATT & WHITNEY ½Bx30, 2 spindle Deep Hole Drill, Latest
PRATT & WHITNEY ⅛Bx50 2 spindle Rifler, Latest

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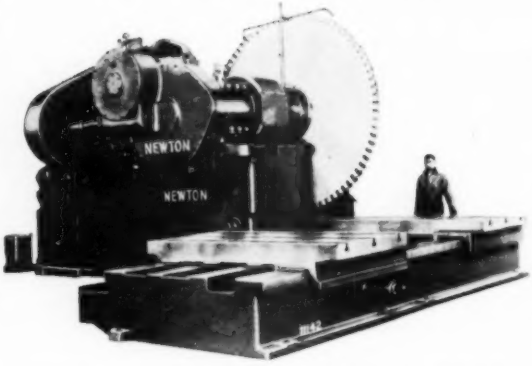

120" Newton Type U-97-A Heavy Duty Cold Saw. Hydraulic Screw Feed. Two Adjustable Cast Steel Work Tables. 75-H. P. Motor and Control. One Inserted Tooth Blade. Capacity 44" Diameter Round Stock.

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- 7/8" x 7/8" Punch, 36" Throat
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- 1⅛" x 1" Double End, 48" Throat
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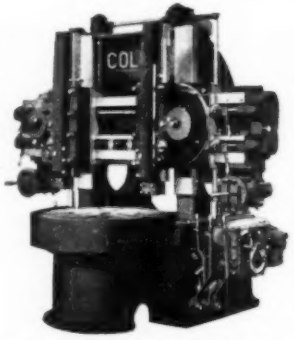

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Norton, Thompson 6"x18" Surf. Grind., Hydraulic Feed
G&L #18, 25, 35 Hyd. Surface
Abrasive #1½, 3B, 34 Surface
Gorton Cutter Grinders
Atlantic 6"x18 Surface Grinder
CINCINATI 12x36" UNIV. GRINDER, HYDRAULIC, FILMATIC
#2 CINN. CENTERLESS, FILMATIC
Covel #9IA Tool & Cutter Grinder
P&W Radius Grinders 12"x36" Surface
Hammond & Exsello Carbide Grinders
Gardner #226 Disc Grinder
Black Diamond Drill Grinder
Oliver 510, Sellers 40 Drill Grinders
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Gall & Jewel Plastic Grinders
NILES BEMENT POND 2500 lb. Steam Hammer
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Sheldon TRB-56" Lathe
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Cinn. & Behauer Speed Lathes
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Gisholt #4, 5 Univ. Turrets, Tooling
Morey #3 Turret Lathe
Acme #6W M.D. Porter 3B
Oster 601 Rapiduction Turret
Hardinge ESM 2nd operation
Brown & Sharpe #1, 2F Hand Screw
GORTON VERTICAL MILL RD, 9J, POWER FEED & PLAIN
Cinn. #2 Pl. Hi Speed Drill
Morey 12M Profiler 2 Sp.
Nichols Hand Mill Vert. Head
Van Norman Prod. Mill, Sunstrand
Burke #4 Mills Pl. & Univ.
Cinn. I-12, 2-18 Prod. Mills
Brown & Sharpe #12 Electric, #000 Production Millers
Van Norman #12, 26, 36 Duplex Head
Cinn. #3 Plain. #4 Vert. Dial Type
Kent Owens Mills #1V, 2-20
Reed Prentice #10D6 60Z. INJ. MOULDER
MARVEL AUTO. HACKSAW #6A
BLISS PRESS #38 OB Gap. 62, 82A, 102
Stokes Tablet Presses
V&O #102 Reducing Presses
Toledo 400 Ton Knuckle Joint Press
Diamond #31, 30 Ton OBI Press
Bliss #4, 5½, Styles Presses
Federal #5 OBI Press, Bliss 21
V&O, Z&H, OBI 25, 35 ton, 25S
Ferracute UDG 36 105 ton Double action cam press
CANDY OTTO 3'x9" COL. RADIAL
Oliver Heavy Die Filer, Fellows 725 Gear Shaper
Onsrud Router #W240
Micromatic Hydroheaner H-1
Waterbury Farrel #3B Thread Roller & Dies 1943
Porter Cable G8 Belt Sander
Bakewell #1, Ultramat Tappers
Haskins 3C Tapper
Taylor Winfield 50 KVA Spot Welders
Thompson & Belsky Seam & Spot Welders
Rafter Mod. 26 Tube Roller
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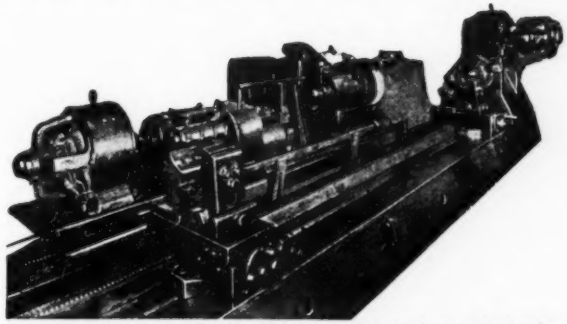

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20 ton Northern Hydraulic Presses
10Z & 20Z Injection Moulders
Famco 6C Arbor Presses—½ Price—Presses
Sheldon 12" B.G. Shaper

AUTOMATICS

Cone 4 spindle, Gridley
Brown & Sharpe #4, 6 Auto., #2 Hand Screw

BORING MILLS

#0 Giddings & Lewis arr. M.D. 3"
2½" Cleveland arr. M.D., 2½", 4" Binsee
Niles-Bement-Pond 4" duplex, 96" Niles
Bullard New Era 24", 42", King 42"

GRINDERS

Surface Grinders, 6x18, 8x24, Abrasive, G. & L.
P. & W. 14", B.B., Vert. Surface 19"x49"
Blanchard 30", M.D.; Modern 12x48" M.D.
Norton Hydraulic 12x18", MD. Cyl.
Heald No. 72A3 Gagematic
Norton 50"x28' M.D. Roll Grinder
Landis Type A 6x20" Hydraulic, M.D. Cyl.
No. 55, 60, 64 Heald Int., M.D.
12" Heald Rotary, Arter 12" M.D.
B. & S. No. 10, 11, Cyl.; 1, 3 Univ.

LATHES

14"x8' Headey Taper, Collets 16"x8'
9" LeBlond, P&W 1"x18" Automatic
36x30' Putnam M.D., 36x22', 42x10
32"x35' Wickes, M.D., American 20"x18" GH, TA
Wade, Hjarth, Hardinge, P & W Precision Bench

MILLING MACHINES

3B K. & T. Dbl. Overarm
Cleveland Vert. No. 1 M.D.; #1 Univ.
#2B K. & T. Univ.; No. 2, 2A B & S Univ.
No. 3B Cincinnati, R.P.D. rapid trav.
Nos. 1½, 2, 5 B & S Plain & Univ.
Hall Planetary Model D Thread Miller, Hansen Whitney
Bookw Nos. 3, AB, 5, 6 Vert.
Nos. 2, 3, 4 Cincinnati Vert., R.P.D.
U. S. Hand Mills

HYDRAULIC EQUIPMENT

500 TON LAKE ERIE PRESS
Platen 35"x38", 36" stroke, 68" opening, 150 H.P., 220-440 V. Motor.
600 Ton Baldwin South Platens 76"x58, Stroke 22", Opening 36".
500 Ton H.P.M. Double Action with 166 ton cushion. Platen 36"x36", Stroke 24", Opening 36".
1000 Ton French-Oil Bed 53x42", stroke 20" daylight 56".
Brand New 300 ton Watson-Stillman Hobbing Press & Pump.
375 Ton ELMES Double Action, with 60 ton cushion. Platen 84"x44", 12" Stroke, 42" Opening.

350 TON VERSON PRESS
40x40 Platen, 36" stroke, 72" opening, 100 H.P. 3 phase—60 cycle 440 volt.

400 & 500 TON SHAFT STRAIGHTENERS, Self Contained

All Hydraulic equipment is completely engineered and checked by a competent staff, thus assuring reliability. Send us your hydraulic problems.

P. & W. No. 12, 1 & 2 spind. Profiler
B. & S. No. 1, 3 Vert., Kempsmith No. 1, 2
Taylor-Sun Spline Miller

RADIALS

Carlton 8' Arm 19" col. M.D., 3½' Mueller
4', 5', 6' American Triple Purpose
Walker-Turner ½" cap., Cinn. Bick. 6'

TURRET LATHES

Foster Nos. 4, 5, 6, 1B, 3B, M.D. Univ
J & L. 2"x24", 3"x36", W & S #4, 2A

MISCELLANEOUS

Buffalo 25UD Comb. Punch-Shear
Pexto 3' to 8' Shears & Brakes
Gorton 1A; 375-2 Tool & Cutter Grinders
Wiedman Turret Punch—Type R4P
6" Vertical Shaper, P & W
10x10 Peerless Universal Shaping Saw
#7, 72, 725 Fellows Gear Shapers
Deckel G1, G2, GIF Engraving machine
Leland-Gifford 1, 2 & 4 spindles, Model MS
Gen OBI 8' 16 Gage M.D. Shear, 12' 16 Ga. Brake
Oster No. 316B 6" Pipe Threader, M.D.
Bliss 36" Gang Slitter, 19, 20, 21 OBI Presses
Double End Buffers, 1HP, 5HP
K.R.W., Lemco Hydr. Arbor Presses
McCabe Pneumatic Flanger

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WOrth 4-8233

New York 12, N. Y.
Cable: AARMACH, N. Y.

MONA

Late Type — EVERY MACHINE TESTED AND GUARANTEED AS REPRESENTED — *Immediate Delivery*

LATHES

SOUTH BEND, 10"x35½", 14½"x6', 16"x8'
BRADFORD, 16"x6'
CLAUSING, 12"x5' M.D.
HENDEY, 16"x6', taper attach.
RIVETT, No. 608 taper attach. precision
LE BLOND 'REGAL', 13"x4'
ELGIN & HARDINGE PRECISION, 17" cap.
PRATT & WHITNEY, 10"x30", precision
PRATT & WHITNEY, 13"x6', taper attach.
SIDNEY, 18"x10', taper attach.
SEBASTIAN 12"x6' GH M.D.
AMERICAN 18"x8' M.D.
SPRINGFIELD 16"x6"; Motor in Base, 12 speeds
MONARCH 14"x8' GH TA.
AMERICAN 20"x12' GH, QC, TA.
AMERICAN Pacemaker 16"x54" latest

TURRET LATHES

WARNER & SWASEY #5 Universal, Preselector
GISHOLT, bar equip. preselector, #5, #1L
WARNER & SWASEY, #1A chucking
FOSTER, #5 universal, bar feed
SIMMONS MICRO-SPEED, 1¼" cap. bar feed
WARNER & SWASEY #1, ⅝" cap. hand.
BROWN & SHARPE #1 Hand Screw
BARDONS & OLIVER #5 Preselector 2" cap

SHAPERS

Gould & Eberhardt, 16", 20" Industrial
Stockbridge, 16", M.D.
Atlas on stand, bench 7", M.D.
Shaperite floor model 8" NEW

DRILL PRESSES

American Radial, 4'x11" column
Avey, #2 single spindle, 15" overhang
Leland-Gifford, #2, single spindle
Allen, 6 spindle, #2, 12" overhang
Buffalo #22 BG, PF, #4 MT.
Cleerman drill box col, 25", #4 MT.

GRINDERS

BROWN & SHARPE #2 Universal
NORTON #2 Universal Hydraulic Tool & Cutter
COVEL, #91A, tool & cutter universal
LANDIS, cylindrical, type H, 4"x12"
HEALD #72A3, plain internal, HYD.
BLANCHARD, VERTICAL SURFACE, #16, 26"
BLANCHARD, VERTICAL SURFACE, #11, 16"
ABRASIVE, VERTICAL SURFACE, #33, 84x24"
BROWN & SHARPE, #5 surface, hyd.
REID, SURFACE, 2B Pope spindle
RIVETT #104—Int.—Ext. Latest
BROWN & SHARPE #2 & #2B Surface
Excello Thread Grinder #31
GALLMEYER & LIVINGSTON 12x24 Hydraulic
Jones & Lamson Thread Grinder, 12"x45"
Do-All Hyd. Surface Grinder 6"x18"
Cincinnati Universal Grinder 12"x36", ext.-int
Wicaco Precision Internal
Cincinnati cylindrical 12x72" centers
Brown & Sharpe #13 Univ. Tool & Cutter

PLAIN MILLERS UNIVERSAL

BROWN & SHARPE, #3A, UNIVERSAL
BROWN & SHARPE, #3B, PLAIN
BROWN & SHARPE, #3, UNIVERSAL
CINCINNATI, #2MH, Universal
KEARNEY & TRECKER, #1B, S.P.
BROWN & SHARPE #2 Light Type, Vertical Head
VAN NORMAN #½ and #12 Duplex Ram type
VERNON Miller, motor in base
CINCINNATI #3 plain M.D.
HENDEY universal #2B Vert. attach.
PRATT & WHITNEY #12B Profiler 2 sp.

VERTICAL MILLERS

CINCINNATI, #3, #4, dial type
VAN NORMAN, #3V, rapid traverse
KEARNEY & TRECKER, #3KM, dial type
KEARNEY & TRECKER, #3H, dial type
PRATT & WHITNEY Jig borers #2

PRODUCTION MILLERS

WALTHAM thread miller, ext. & int.
CINCINNATI, #1-12 automatic
KEARNEY & TRECKER, #1H-18 Mfg. type
BROWN & SHARPE #000, high speed

GEAR MACHINERY

FELLOWS #9A
GLEASON, 18" and 24" cap. Bevel Gear Cutters
GOULD & EBERHARDT, #3-5, spur gears

AUTOMATIC SCREW MACHINES

BROWN & SHARPE, #0G, ⅝" cap.
BROWN & SHARPE, #2, high speed
BROWN & SHARPE, #00, high speed ⅜" cap.
ACME GRIDLEY 2" cap. RA6
ACME GRIDLEY 1" cap. RA6

BOREMATICS AND BORING MILLS

Defiance #25A Horizontal 3¾" Bar
Lucas No. 41, 3" cap. extra long table

PRESSES, SHEARS, BRAKES

Niagara 6'x10 gage, 16" gap
Pameo Shears, 36", 52" NEW
Ferracute Press #C3, inclinable
Lake Erie hydraulic 750 ton like new
Diebel Hi-speed and roll feed
Hydraulic Press 25 ton to 750 ton
Bliss Incl. #20 roller pin clutch
Buesch #2 percussion press, 60 ton.

MISCELLANEOUS

Doall continuous bandfiler Model BF
Riveting Hammers, high speed, #5A
Spot Welders 5 KVA to 100 KVA
Fanco Foot Presses, #6, #8, #10, #12, #15
BUTTERFLY Filing machines
Porter Cable belt sanders

ROWBOTTOM Cam Miller

Sonntag Combination punch & shear #16 with notcher, M.D.

Watson Stillman 200 ton hobbing press with duplex pump.

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FOSTER MACHINERY SALES CO.

DRILLS

Atlas 2 spdl. 7½" overhang, Table 30x31.
High Speed Hammer sensitive type, 1¼" cap. 4 speeds, 750 to 6000 RPM—5 ea.
Fosdick Model 4BM #2 MT. 6 speeds 225 to 1800 RPM.
Footburte 1 spdl. #3 MT. 8" O.H. Table 18x22.

GRINDERS

Heald No. 72-A-3 Sizematic Internal Centerless 2 ea. Ser. No. 21621 and 21685.
Heald No. 78 Internal Centerless type.
Detroit Gear Grinding Internal Gear Grinder.
Fitchburg Gear Tooth Grinder, 20".
Excello No. 33 Thread Gr., Ser. No. 4485.
J.&L. No. 615 Thread Gr. Ser. No. 130249.
Coval Tool & Cutter No. 91A, Ser. No. 91A-548.
Cincinnati Universal 12x36 with Int. Spdle.
Norton Plain Cyl. 6x18, Ser. No. 18184.
B.&S. No. 5, 3x18" with Auto. infeed.
Thompson 6x18 Hydraulic Ser. No. 42368.

LAPPING MACHINES

Red Ring Gear size 15" extended bed and 18" Ser. No.'s G-LL-347 and 345. Like new.
Norton Cam-O-Lap, Type 34, Ser. No. LC-2305.
Ultra Lap No. 10, Ser. No. 102163.

BORING MILLS

Excello No. 112C, 1 spdl. with Univ. Fixture.
Excello No. 2112 single end, single spindle.
Baker No. 2C for Boring, drilling & tapping, 90" index table, standard Mod. 5-A-12 Hd.

LATHES

Monarch 10"x120" cc. Taper Attach. chucks, etc.
Fay Automatics size 16x21, 20x25, 20x37, Ser. No.'s 82431, 81965, and 82492. (1942)
LeBlond Model 13—Rapid Production.
Gisholt No. 1L, extended bed, Ser. No.
Gisholt No. 2L Turret, cross sliding Turret.
Denver 6R Turret, Bar Feed, (2) cheap.
Bardons & Oliver Turret #5, Bar Feed.

MILLS

Cincinnati No. 2-24, Ser. No. 1B2PIM-101.
Cincinnati No. 2-18 2 ea. Ser. No.'s 1B2PIL-241 and 1B2PIJ-514, both in excel. cond.
Cincinnati No. 00 Horiz. Ser. No. 3FIP2J-391.
Cincinnati No. 00 Verticals, 3 ea. all late!
Milwaukee Model 1-H-12, Ser. No. 15-3173.
Giern & Anholt Spline Mill, will mill 50" spline.
Rice Barton Spline Mill, 4" spline.
Murchey Thread Mill Ser. No. 610-1, Model 42, 4 to 12".

MISCELLANEOUS

Westinghouse 300 amp Transformer type portable welders, 15 ea.
Elwell Parker platform low lift, style G-EP 6000#, Gas.
Illinois Gear Concentricity measuring machines Model 514.
Vinco Master Involute Gear Checker.
Gisholt Static Balancer Model 12E, 2 ea.
Red Ring Gear Speeder 10".
Coval Hanchett circular saw sharpener.
Barnes No. 172 Vert. Honing Machines 2 ea.

Many others not listed please advise us of your needs.

ALL MACHINES LISTED ARE 1940 OR LATER

OFFICE AND WAREHOUSE-1880 HAWTHORNE
TWINBROOK 1-0354 DETROIT 3, MICHIGAN

UNUSUAL VALUES

Milling Machines—No. 1, Universal, No. 1 American (new) plain, No. 1 Vertical.

Drills—Large selection, single and multiple spindles also bench types, many of them new.

Gear Cutters—Brown & Sharpe No. 3—26" Gould & Eberhardt 42".

Grinders—Cylindrical B & S No. 11, Planer type 16"x36", Surface 12"x6", also new (small) Universal bench and floor type. All with coolant, motorized.

Lathes—14"x6', 8', 10—16"x6', 8', 10'—18"x6', 8', 10'—26"x16'—all cone drive, several motorized also (new) 18"x8' and 10' geared head, motorized
Large stock 19" and 18" bench and floor type.

Planers—Single head 24"x6', 24"x8', 26"x8'.

Shapers—16", 20", 24", B.G. crank.

Turret Lathes—J & L 2"x24"—3"x36" also Acme, W & S Turret (vertical) boring and facing mills, 5 hole turrets, 30", 40".

SPECIAL—New totally enclosed dust proof, fan cooled, ball bearing saw arbor motors, plain shafts to size or threaded, and with collars, measures only 3¼" from center of shaft to flatted top (1 h.p. to 15 h.p.) 2 or 3 phase, 3600 r.p.m.

WOOD WORKING MACHINERY—A very large stock of new and re-built, practically all motorized. New Motorized overhead cut-off and miter saw for wood, plastics, steel, aluminum and other metals. The above list is only a fraction of our stock which changes almost daily, therefore, tell us definitely what you want since we are adding considerable number of machines to our stock which are too many to list. What we have today may be sold tomorrow, so a list is really not dependable.

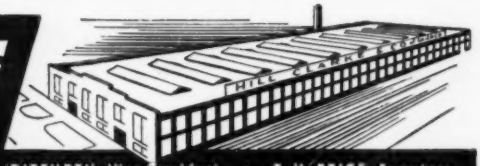
Drill—Foote-Burt No. 25 24" Hi Duty 3" capacity in steel. Motor attached.

PATTERN MAKING MACHINERY—42"x16' bed wood lathe, compound rest, rack and pinion feed to carriage; 10" heavy duty jointer, extra long bed, front table tilts for giving draft to pattern work; tilting table also tilting arbor rip and cut-off saws; band saws; jointer; floor and bench type trimmers; and also many other machines for pattern work.

THE OSBORNE & SEXTON MACHINERY CO.

P. O. Box 88, Columbus 16, Ohio

HILL-CLARKE MACHINERY COMPANY



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FOR YOUR PROTECTION ONLY HILL-CLARKE OFFERS YOU THIS 5 WAY GUARANTEE

1. A responsible organization—over 80 years experience.
2. Modern machines—no worn out equipment.
3. Every machine remanufactured or carefully inspected by experienced craftsmen.
4. You can see your machine tested under power.
5. Hill-Clarke's unconditional money-back guarantee.

STEWART WARNER CORP'S GEO. L. MEYER, JR., V. P. Stewart Die Casting Division tells Hill-Clarke's President H. W. Mons, right, "The used machines we have purchased during the past 30 years from Hill-Clarke have always given us excellent performance."

AUTOMATICS

1⅝" Greenlee, 6 Spdls. (1941)
No. 61 New Britain 6 Spdls. 1⅝" (1942)
No. 6 Brown & Sharpes
No. 49 New Britain, 4 Spdls.

DRILLS

No. 150 Baker
No. 314A Baker
No. D8 Colburn No. 6 Morse Taper
No. 1LMS—20"—5 Spdl. Leland-Gifford
No. 2LMS—26"—1 Spdl. Leland-Gifford
No. 2LMS—14"—3 Spdl. Leland-Gifford
No. 2LMS—26"—4 Spdl. Leland-Gifford
No. 2LMS—26"—6 Spdl. Leland-Gifford
No. 3B—24"—6 Spdl. Edlund (1942)
No. 4BL Natco 36 Spdls.
6'-17" Col. Fosdick Radial
7'-15" Col. American Full Universal

GEAR MACHINES

No. 61A Fellows Gear Shaper
No. 61A Fellows
No. 7125 Fellows (1943)
No. 712 Fellows Auto Indexing (1943)
No. 72 Fellows Gear Shaper
No. 18H Gould & Eberhardt
No. 6 Gleason Gear Tester
12" Gleason Bevel Gear Cutter
72" Cincinnati Gear Cutter

HORIZONTAL BORING MILLS

No. 31 Lucas, 3" bar
No. 46-B Heald Bore-Matic

GRINDERS

4"x12" Landis, Model H (1942)
4"x18" Landis Model H (1942)
6"x18" Norton Type C Plain (1943)
6"x30" Norton Type C Plain (1943)
10"x18" Norton Type C Plain (1943)
10"-14"x36" Norton Type C Plain (1942)
10"x48" Norton Type C Plain (1943)
Norton Motorized Grinders
6"x18" —— to —— 24"x240"
12"x36" Landis Type LCH Universal (1945)

No. 5—8"x24" Covel Hydr. Surf. (1941)
No. 25A—24" Heald Rotary Surface (1943)
No. 36-A Hanchett Rotary Surface

72A-3 Heald Internal Grinder (1942)
72A-5 Heald Internal Grinder (1942)
74 Heald Internal Gdr. (1942)
No. 5 Bryant Internal Grinder (1942)
No. 16-16 Bryant Internal Gdr. (1942)
No. 16-36 Bryant Internal Grinder (1942)
No. 24—26 Bryant Internal Grinder (1941)

LATHES

16"x54" centers LeBlond (1941)
16"x60" centers Pratt & Whitney, Model B
18"x6' American, Grd. Head
19"-38" gap x 10' LeBlond
36"x30' Lodge & Shipley
36"—49"x16' Lehman Hydratrol (1945)
48"x20' centers Simmons (1942)
50"x17 centers LeBlond (1942)

LATHES (Production)

8"x15" Sundstrand, Model D (1943)
10"x16" Sundstrand
10"x22" Sundstrand, Model AA (1943)
16"x33" Fay Automatic (1942)
20"x25" Fay Automatics (1942)
No. 3A Lodge & Shipley Dutomatic

MILLING MACHINES

No. 4 Cincinnati Plain (1943)
No. 2 H Milwaukee Vertical
No. 2 Cincinnati Vert. (1942)
No. 2M Cincinnati Vert. (1941)
No. 3 Cincinnati H.P. Vertical
No. 1-18 Cinn. Mig. (1940)
No. 2—18" Sundstrand-Electromil (1942)
No. M-24 Milwaukee Simplex (1942)
38"x40"x10' Fitchburg Duplex Miller (1943)
No. 4-48 Cinn. Hyd. Tracer (1942)
No. 34-48 Cincinnati Hyd. Duplex
No. 45-48 Cinn. Hyd. Plain Tracer (1942)
4"x9" Hanson-Whitney Univ. Thrd. Miller
4½"x12" Pratt & Whitney, Model C
6"x36" Lees-Bradner—Model HT (1943)
6"x48" Pratt & Whitney Thrd. Miller
6"x80" Pratt & Whitney Thread
6"x168" Pratt & Whitney Thread
10"x48" Hanson-Whitney Thread
24"x24"x12' Ingersoll Adj. Rail
36"x36"x16' Ingersoll Slab Miller
No. 10 Ingersoll 72"x6' Traveling Col. Face Millers (1942)

MISCELLANEOUS

18" Dill Slotter
Model H-7 Micromatic Hydro Honer
Model H-2 Micromatic Hydro Honer
Model 200 Micromatic Hydro Honer
8-M Wells Band Saw
No. 20 Bliss O.B.I. Press
No. 2 V & O open back press

PLANERS

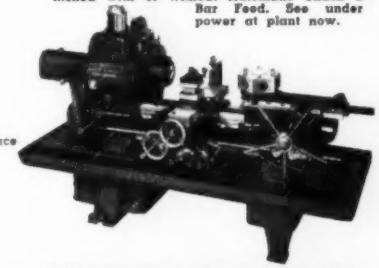
36"x36"x12' Cincinnati
36"x36"x18' Gray, 4 Heads
48"x36"x14' Gray
48"x48"x12' Cincinnati, 4 Heads

TURRET LATHES

No. 3 Jones & Lamson Bar Feed
No. 4R Libby, Bar Feed
No. 5 Warner & Swaseys (1942)
No. 5 Bardons & Olivers (1942)
No. 5 Midland, Bar Feed
No. 2-A Warner & Swasey
No. 1-H Libby, 6¼ Hole in Spindle (1937)
No. 1-H Libby, Extras Long Bed (1942)
18" Libby, 3½" Hole in Spindle
No. 4A Warner & Swasey, 7½" Hole in Spindle
No. H-S Libby
42" Bullard New Era
42" Colburn
60" Colburn
72" Niles Extra Heavy
84" Betts

FEATURE OF THE MONTH

No. 5 Warner & Swasey Universal Turret Lathes with Surface Speed Preselectors. Furnished with or without Automatic Chuck & Bar Feed. See under power at plant now.



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THE "LIKE NEW" PERFORMANCE WITH CIMCO REBUILT TOOLS

AUTOMATICS
#1 B & S Hand Screw Machine
#4 B & S Hand Screw Machine

ALL SIZES NEW HACK SAWS

DRILLS—RADIAL
5'-15" Column Carlton Radial Drill
2'-6" Plain Radial Drills
7' American
7' Cincinnati Bickford, gr. box
4' Carlton, gear box
6' American Triple Purpose
5' Fosdick Plain, Gear Box

GRINDERS—PLAIN
#12 Brown & Sharpe Plain Grinder
10"x24" Landis C Hyd. Univer. Grinder
No. 2 Landis Univ. belt drive
18"x72" Landis, belt drive
18"x72" Cincinnati, latest type
20"x240" Landis, M.D.

GRINDERS—TOOL & CUTTER
#51 Oliver tool grinders
#13 Brown & Sharpe Cutter Grinding Machine
#2 Cincinnati Tool & Cutter Gr. New 1942

GRINDERS—SURFACE
6"x18" Thompson Hydr. Surface grinder
14"x18"x72" G & L Model A Hyd surface grinder
12"x48" Cincinnati Grinder

LATE TYPE
20" Cincinnati Univ. Shaper

EXCEPTIONAL BUY
18"x54" Lodge & Shipley Lathe, late type.

LATHES
#6 LeBlond Multi-cut
10" Rivett Bench Type
14"x5' Lodge & Shipley Belt dr.
14"x6' LeBlond Gr. Hd.
14"x6' Lodge & Shipley cone belt dr.
16"x6' American Belt drive
16"x8' American Screw Cutting Engine Lathe

LATHES (Cont.)
18"x6' Boye & Emmes Belt drive
18"x9' L & S Bowl hd.
18"x8' Sidney Lathe Bowl Type
20"x10' Lodge & Shipley Belt dr.
24"x12' American 8 Sp. Gr. Hd.
24"x22' Lodge & Shipley Gr. Hd.
25"x12' LeBlond Gr. Hd.
36"x36' American Geared Head
30"x10' Centers Nile Timesaver

TURRET LATHES
21" Gisholt Turret Lathe
3L Gisholt Turret Lathe
#4 Millholand
24"x24" J & L Flat turret
30"x32" J & L Flat turret
36" Bullard Univ.

MILLING MACHINES
Sundstrand 00 Hydraulic
#118 Van Norman Production Millers
25" Cincinnati Semi-Automatic
New Burke Hand Millers
1½ BS Double overarm miller
3S Cincinnati Plain
2B—B & S meter in base
#2M Cincinnati Vert. Mill
#4 Cincinnati Hor'z. Dial Type
#3 Cincinnati Medium Speed Dial type, Vert.
40" Ohio Tilted Rotary Miller

UNUSUAL BARGAIN
#4 Cincinnati Vert. Miller, Late Type

SPECIAL
#3A Warner & Swasey H.D. Saddle Turret Lathe, Late Type, Equal to New

PLANERS
30"x30"x20" Gray Planers
42"x42"x20" Cincinnati Planer
72"x22"x20" Niles Bement Pond
42"x42"x20" Cincinnati Hypo

SHAPERS
15" Smith & Mills
20" G & E Shapers
20" Ohio Belt Dr.
24" Cincinnati Belt dr.
24" Potter & Johnson

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Cincinnati Machinery Co., Inc.
219 East Second Street
Cincinnati 2, Ohio

REYNOLDS of PROVIDENCE
OFFERS OUTSTANDING USED MACHINERY BARGAINS!

Stock No.	Machine	Selling Price
2987	18"x30" Lodge & Shipley Lathe, geared head, 220-440/3/60, taper attachment, dog plate, face plate, back rest, no chuck, serial 30882	$3250.00
2173	#2-H Milwaukee Plain Miller, 440-3-60, 110 volt control, 2 standard arbor supports, pump, ser. #69-3685	$3750.00
2172	#2-HL Milwaukee Plain Miller, 220-3-60, 2 standard arbor supports, pump; ser. 14-3676	$3350.00
2171	12x36 Cincinnati Universal Grinder, internal spindle, 550-3-60, back rest, chuck, face plate, 3 follower rests; ser. 2UD1K-77	$5500.00
2179	#30-A Fosdick Jig Borer, 220-3-60, ser. 10860	$5500.00
2176	#3-H Milwaukee Vertical Plain Miller, pump, ser. #48-4192	$5500.00
2174	#2-K Milwaukee Plain Miller, 2 standard arbor supports, pump; ser. 13-3613	$4250.00
2175	#2-K Milwaukee Plain Miller, 2 standard arbor supports, pump; ser. 14-3613	$4250.00

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303 EDDY STREET
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STOCK TOOLS — Prompt Shipment
BORING MILL, Hor. #0 G & L, 3" bar.
BORING MILL, Vert. 14' Niles 2 Hds., M.D.
BORING MILL, 42" King, 2 Hds., M.D.
BORING MILL, 72" N-B-P, 2 hds., M.D.
BRAKE, Press, 36 Ft. x ⅜", 60" thrt., M.D.
BROACH, XA Oilgear, Hor., 60" Str.
DRILL, Radial 3' & 5' Cincinnati-Bickford.
DRILL, Radial 6' American, Mfr. on Arm.
GEAR HOBBERS, 12-H Gould & Eberhardt.
GRINDER, Broach, "E" Thompson, 6x48" Hyd.
GRINDER, Int., No. 72-A-5 Heald, Hydraulic.
GRINDERS, Surf., Non. 3 & 5 Abrasives.
GRINDER, Surf. Rotary No. 25 Heald.
HAMMER, Pneumatic, Nos. 4-B & 6-B Nazel.
HAMMER, St. Forging, 6000# Chambersburg.
LATHE, 14"x6' Heading, Tie-Bar, T.A., M.D.
LATHE, 14"x6' L & S, 12-Speed Grd. Hd.
LATHE, 22"x16' L & S, Q.C.G., T.A.
LATHE, 42"x8' e-c, L & S, e.e.e.
LATHE, Turret, No. 3-A W & S, 4½" h.s.
MILLERS, Pl. No. 4, & 5 Cincinnati.
MILLER, Plain No. 4B K & T, Vert. Att.
MILLER, Thread, No. 40 Lees-Bradner.
MILLER, Duplex, 24" Cincinnati.
MILLER, No. 2—24 Cincinnati, Rise & Fall
MILLER, Univ., No. 4 Cincinnati
PRESS, No. 59¼ Toledo, 1200 Ton, 14" Stroke
PRESS, S.S., 250 Ton Chambersburg, Hyd.
SHAPERS, 24" and 32", M.D.
SHAPER PLANERS, Gpenside, 26" Farquhar.
SHEARS, 12' x 18 ga., 11'x1½".
UPSETTER, 4" National, M.D.

LANG MACHINERY COMPANY
28th St. & A.V.R.R. Pittsburgh, Pa.

MACHINERY IN STOCK
AUTOMATIC—2⅝" N.B. 4 Sp. 1940
DRILLS—Walker Turner Radial, 4 Sp. 17" P. F. Delta 1946.
MILLS—45-60 Cin. Hyd 1933. #3 Van Norman Plain 1943. 35-60 Cin. Duplex Hyd. 1933. #1-12 Cin. Automatic 1942. Thread 20 MB Smalley General. Taylor Fenn Duplex 4" Late. K & T Vert. Rot. Table Built in.
TURRET LATHE—#5 and #7 Fosters 1940
TAPPERS—#2½ Allen #3 NT 15" Throat.
#3 D.B. Cleveland 1½" 1944
GRINDERS—Landis 14x72 ser. 15806. Norton 10x36 Angle 45° Cyl. 1943. Cin. 10x18 Plain Cyl. 1941. Cin. 14x36 Univ. Cyl. 1944. Landis 4x12 Mod. 4H 1942. Excello #33 Thread 6x18—1944. Heald 72-A-5 Internal 1941. B & S #2 Univ. 1938. Pratt Whitney 9" Spur Gear Ser. 132. Pratt Whitney 10" Spur & Helical. Ingersoll Cutter 30" Ser. 15121.
MAGNA FLUX—ANQ 484 S AC 1943
CHIP WRINGER—40" Tollhoist 1945
DUST COLLECTOR—6D, 10D Rotolone
M.G. Set 100 KVA 2300 V Syn to 230 Volt DC, Older

INDUSTRIAL SERVICE, INC.
Elk at East 105th St. Cleveland, O.

Landis Type D Plain Grinder 20x48", late model.
#2 Cincinnati Centerless Grinder, old.
Kearney-Trecker 2-spindle milling machine, old.
Fay Automatic Lathe 27" centers, old.
Nafco boris, 40-1 end drill, machine, late model.
Crown tumbl. barrel, maple wood lined 30x65", new.
Grob saw Model 08-20 late model.
#6 Bliss punch press 125 ton cap., late model
Lindberg electric furnace 1250°, new.
Demco tapper, 3 spindle, late model.
The Perfection Steel Body Co., Galion, Ohio

200 hp ELECTRIC MOTOR—Westinghouse 440/220 v, 227 amp, CCL Induction Constant Speed, 1150 rpm full load, 3 phase 60 cycle. With starter box, good condition, $2000.
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used and rebuilt
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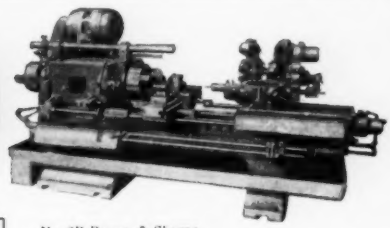

AUTOMATICS
Bullard Mult-Au-Matic, 6 spdl. Model D. 1941.
6" Conomatic, 4 spindle. 1943.
6" Goss & DeLeeuw Chucker, 8 spdl. 1943.
9/16" RA-6 Gridley. 1943.
9/16" RA-6 Acme Gridley Chucker. 1942.
No. 60 New Britain, 6 spindle. 1942.
Model 3-8 Ceco. Late.

BORING MACHINES
3" Yoder Boring Mill. 1942.
No. 49 Heald "Bore-Matic". 1942.
No. 47A Heald "Bore-Matic". 1942.
No. 2112A Excello. 1943.

BROACHES
No. CPC 6-30 LaPointe Vert. 1941.
No. V—1½ American Vertical. Late.
40 Ton LaPointe Vert. 66" stroke. Late.

DRILLS, HEAVY DUTY
No. H3 Barnes Vert. Hydram. 1942.
25" Fosdick Economax. 1941.
24" Sibley Sliding Head. 1942.
No. 3 Bausch Multiple Spindle.
Fox Multiple Spindle. 1944.
Barnes 2 Spindle Deep Hole. 1943.
No. ½ B P & W Deep Hole. Late.
No. ½ B P & W Reamer. Late.
No. ½ B P & W Hyd. Rifler. Late.

DRILLS, RADIAL
6' 17" Carlton. 1942.
3' 9" Dreses. Late.
20" Pfiffner Drillmaster. 1942.

DRILLS, SENSITIVE
20" Walker Turner 6 Spindle. 1942.
No. KH2 Allen, 6 Spindle. 1943.
16" Atlas, 4 Spindle. 1942.
15" Atlas, 4 Spindle. 1942.
14" Delta. 4 Spindle. 1942.
No. 2 Motor Avey, 4 Spindle. 1943.
No. 2 MS Allen, 1 to 3 Spindle. 1942.
No. 2 Motor-Avey, 3 Spindle. 1942.
No. 2B-8 Edlund, single spindle. 1942.
No. 2 Hamilton-Muehlmat. 1943.
Leland-Gifford, Single Spindle. 1942.

GEAR EQUIPMENT
No. 5 AC Lees Bradner Gear Gen. 1941.
No. 7A & 715 Fellows Gear Shaper. 1942.
No. 7125A Fellows Gear Shaper. 1945.
No. 615-A Fellows Gear Shaper. 1944.
No. LS Fellows Gear Lapper. Late.
No. 6 Gleason Tester. Late.
No. 12 Gleason Tool Sharpener. 1942.
Model GCL-3 Red Ring Gear Shaver. 1942.
15" Red Ring Gear Lapper. 1942.
Red Ring Universal Gear Checker. Late.
Type S Barber-Colman Hobber. 1942.
No. 140 Cleveland Hobber. 1942.
Vinco Spline & Gear Grinder. 1942.

GRINDERS, CYLINDRICAL
14"x36" Norton Type C Universal. 1943.
12"x48" Cincinnati Universal. 1943.
10"x24" Landis Type C Universal. 1942.
10"x18" Norton Type C Plain. 1942.
6"x30" Cincinnati Plain. 1943.
6"x18" Landis Type C Plain. 1941.
6"x18" Norton Type C. 1942.
4"x12" Landis Type H Plain. 1942.
No. 2 Brown & Sharpe. Late.
No. 5 Brown & Sharpe Plain. Late.
No. 2 & 3 Cincinnati Centerless. 1942.

GRINDERS, INTERNAL
No. 81 Heald "Sizematic". Late.
No. 74 Heald Extended Bridge. 1941.
No. 75A Heald, two motor. 1943.

NO. 2 FU FOSTER FASTERMATIC UNIVERSAL SADDLE TYPE TURRET LATHE. Automatic cycle, 28 speeds (17 to 277 RPM). Timken bearing spindle, 8" flanged type spindle nose, 3" hole in spindle, 25¼" swing over ways, max. distance spindle nose to hex turret 50 3/16", with air chuck and cylinder, assorted tooling, coolant, motor and controls. New 1943.

No. 72A3 Heald Plain. 1942.
No. 72A5 Heald Plain. 1944.
No. 16 CP-16" Bryant. 1942.
No. 104 Rivett. 1942.

GRINDERS, SURFACE
16"x16"x48" Thompson, Type C. 1943.
14"x36" Pratt & Whitney Vertical. 1942.
6"x18" Robot. 1942.
72" Rogers Knife Grinder. Late.
No. 2B Reid. 1944.
No. 2C Reid. 1945.
No. 25A Heald Rotary. 1942.
No. 22 Heald Rotary. 1943.
6" Taft Pierce Rotary. Late.
A-18 Arter Rotary. 1942.

GRINDERS, TOOL & CUTTER
No. 2 Cincinnati Univ. 1941.
No. 13 Brown & Sharpe Univ.
No. 91A Covel Universal. 1942.
No. 22 Covel Universal. 1942.
No. 4T Sellers Carbide Tool. 1942.
No. 6G Sellers Drill Grinder. 1942.
Barber-Colman Combination. 1943.
No. 44, 48 & 49 Excello. 1942.
Milwaukee Face Mill. 1942.

LATHES, ENGINE
18"x54" Lodge & Shipley. 1943.
18"x54" Sidney. 1943.
18"x48" Bradford. 1942.
16"x8' South Bend c.d. 1944.
14"x7' South Bend c.d. 1943.
14"x54" Reed Prentice. 1942.
14"x30" Lodge & Shipley. 1943.
14"x6' Hendey.

LATHES, PRODUCTION
14"x42" Monarch "Magna-Matic." 1941.
9"x20" Lipe. 1942.
8"x36" Lo-Swing Semi-Auto. 1942.
8"x21" Fay Automatic. 1942.
Model 10 Sundstrand. 1942.
Model 8 Sundstrand. 1942.
Model 1MP & R Lo-Swing. 1942.

LATHES, TURRET
No. 2A Warner & Swasey. 1942.
No. 1A Warner & Swasey. 1944.
No. 9A Jones & Lamson. 1942.
No. 1 Acme Universal. 1941.
8⅛"x24" Acme. 1943.
No. 3L Gisholt. Late.
No. 2L Gisholt. 1943.
No. 5 Warner & Swasey. 1941.
No. 4 Warner & Swasey. 1941.
No. 3 Warner & Swasey. 1943.
No. 2 Warner & Swasey. 1941.
No. 2, 5 & 7 Bardons & Oliver. 1941.
No. 3 & 4 Gisholt. 1943.
No. Midland. Late.

MILLING MACHINES, PLAIN
No. 3B Brown & Sharpe. 1941.
No. 2H Milwaukee. Late.
No. 2HL Milwaukee. 1942.
No. 2M Cincinnati.
No. 2B Brown & Sharpe.
No. 3 Van Norman. 1942.
Van Norman Hand Mill. 1942.

MILLING MACHINES, PRODUCTION
No. BL2420 P & W "Keller", 3 spindle. 1942.
No. BL2416 P & W "Keller", single spindle. 1943.
No. BG-1 P & W "Keller" single spindle. Late.
No. 34-36 Cincinnati "Hydromatic". 1942.
No. 3-36 Cincinnati "Hydromatic". 1943.
No. 1248 Milwaukee "Simplex". 1942.
No. 08 Cincinnati, Rise & Fall. 1942.
No. 2-18 Cincinnati, Rise & Fall. 1942.
No. 1-18 Cincinnati. 1942.
No. 12 Brown & Sharpe. 1942.
No. 1-14 Kent Owens. 1943.
No. 2-20 Kent Owens. 1942.
No. MM-1-5-2 U.S. Multi-Miller. 1943.
No. MM-1-6 U.S. Multi-Miller. 1942.
No. 0 & 2 Sundstrand. 1943.

MILLING MACHINES, THREAD
12"x54" Lees Bradner. Late.
8"x16" Hanson-Whitney. Late.
4½"x12" Pratt & Whitney. Late.
4"x9" Hanson-Whitney. Late.

MILLING MACHINES, UNIVERSAL
No. 2 SU Van Norman. 1942.
No. 2H Milwaukee. 1942.
No. 1 Cincinnati.

MILLING MACHINES, VERTICAL
No. 2 Milwaukee, Model D. 1945.
No. 3K Milwaukee. 1942.
No. 3H Milwaukee. 1940.
No. 2K Milwaukee. 1942.
No. 3 Cincinnati. 1942.
No. 2 Cincinnati. 1940.
No. 2 Milwaukee.
No. 1 Cleveland. 1942.

MISCELLANEOUS
10'x14 Ga. Chicago Press Brake. Late.
6'x⅛" Bertsch Bending Roll. Late.
No. 35S Chicago Press Brake. Late.
No. 405 Williams Turnings Crusher. 1943.
200 Lb. Bradley Helve Hammer. 1941.
No. 7B High Speed Riveting Hammer. 1942.
J & L Comparator. Late.
50KVA Federal Spot Welder. 1942.
Model MA Sunnen Hone. 1942.
No. 616 Cleveland Rigidturner.
No. 26 F Norton "Hyprolap". 1942.
No. 74 Excello Center Lapping Mach. 1942.
3" Leland Gifford Radial Tapper. 1941.
No. 1 Savage Roller Type Nibbler. New.

PLANERS & SHAPERS
52"x36"x40' Cincinnati Planer.
36"x36"x16' Ohio Planer.
28" Smith & Mills Shaper.
16" Gould & Eberhardt Shaper.
12" New Haven Vertical Slotter. Late.
6" Pratt & Whitney Vertical Shaper.

PRESSES
100 Ton Hannefin Hydraulic. 1942.
50 Ton Dennison. Late.
45 Ton Reliance. 1942.
No. 8-6 Zeh & Hannemann. 1942.
No. 1 Ross O.B.I. Late.
No. 18 Bliss O.B.I. Late.

SAWS
10"x24" Peerless Vertical. 1942.
14"x20" Racine "Shear Cut". 1942.
13"x13" Peerless Universal. 1943.
11"x11" Peerless "Hydra Cut". 1945.
No. 5 Wells Band. Late.

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SEARCHLIGHT SECTION

ROLLS—BENDING—Hilles & Jones, 30'x¾" Pyramid, Top Roll 30", Bottom Rolls 20". Motors 75 & 45 HP, 3/60 220-440 controls. New shipyard type—will convert to drop end. Fast delivery. Wt. 120 Ton.

ROLLS—BENDING—Cleveland #2A, 10'x1½", Pyramid Type, Drop End, 20 H.P.

IRONWORKER—Combination Punch & Shear, Schautz, Angles 3½"x3½"x ½", Rounds & Squares 1¼"; Punch ¾" thru ½"; Motor 3 H.P., Ser. #1783.

IRONWORKER—Combination Punch & Shear, Oeking, Angles 6"x4"x½", Rounds 1⅝", Sqs. 1⅝", Motor, Machine Ser. #316F.

PLANER—Niles Bement Pond, Working Bed 48"x48"x26' with 4 Heads, 15 H.P., D.C. 230 volt, variable speeds.

HYDROHONER—Micromatic Model #H4 (1943) Cap. 2" diam. x 6" length.

ROTARY GRINDER—Blanchard Cap. 29", Magnetic Chuck, belt drive, old machine, good condition, Bargain..... $750.00

SQ. SHEAR—10'x½" cap., with 13" Gap, 15 H.P., Wt. 20 Ton. Bargain.

PLATE PLANER—Hilles & Jones, 30'x2" cap., Pneumatic Hold-downs, 2 Heads, 5" diameter lead screw, 30 HP, 3/60/220 motor worm drive.

WIRE STRANDER—(1943) Two-Robinson, 6"x7 spool, reel, mtr. 7½ HP.

LATHE—ENGINE—Bridgeford, Geared Head, Q.C., 32"x21' centers, Motor 35 HP, Serial #32,870.

LATHE—TOOL ROOM—South Bend, Latest type, 14"x8' overall, actual 16"x36" centers, taper attach., draw bar & collets, mtr. in base #134077.

MILLER—Plain Horiz. Model #4K, K. & T., like new, latest dial type double overarm, Table 10"x50", power rapid traverse all directions, motor in base, wt. 14,000 lbs.

HAMMER—Drop Forge, Chambersburg 25,000 lb. cap., like new, air or steam operated, height 24', Weight 525 Ton.

UPSETTER—Horiz. Forging, Ajax #2½", Mtr., 15 H.P., Wt. 15 T. approx.

PRESS—LAKE ERIE—750 Ton, Hydraulic, Double Action, Bed 81½"x 148", will draw & lift out 22½", completepump & motors 40 HP & 10 HP controls (1942) Wt. 75 Ton. Single or double action.

POWER PRESSES

PRESSES	TONS	STROKE	BED—FB, LR	TYPE
(2) Bliss #58	22	3"	12½"x 13½"	C Frame (1943)
(4) Ferracute C22	22	5½"	13½"x 14"	Duplex, 2 Presses on 1 stand (1943). Hopper Feed
(3) L. & J. #3	22	2½"	12½"x 21½"	O.B.I. (1945) Air Safety
(7) Diamond #30	31	3"	13" x 22"	O.B.I., Motor (New)
(1) Torrington	30	2" & 1"	23" x 10"	Sub Arch, Dbl Action, Cam
(1) Toledo #54	60	3"	18" x 18"	SS with side shear
(2) Bliss #1085	100	12"	24" x 24"	SS, b.g. (1942)
(2) Bliss #6	125	2" & 5"	24" x 32"	SS, dbig or single action b.g. (1942)
(1) Bliss #407	180	27" & 17"	45" x 54"	Toggle, draw 12½"
(1) Clearing F1209-42	200	30"	38" x 44"	SS, Single Action, (1942) b.g.
(1) Baldwin-Southwalk	250 +	40"	60" x144"	Hydr., SS—4 Post
(3) Bliss #7815 (310)	450	18"	52" x 30"	SS, Single Action, b.g.
(1) Bliss 4188 Toggle	450	25" & 17"	60" x 96"	Toggle, Will draw 11½"
(1) Baldwin-Southwalk	500	42"	52" x 52"	Hydraulic, 4 Column
Lake Erie	750	Up to 40"	81½"x148"	Hydraulic, dbl action. Draw 22½" (1942)
Lake Erie	1320	Up to 36"	48" x 80"	Hydraulic (1942)
(1) Toledo #185	1400	20" & 18"	72" x 72"	Toggle, will draw 13"

MONA MEMBER

KINGS COUNTY MACHINERY EXCHANGE

408 Atlantic Ave., Brooklyn 17, N. Y. Phones: TRiangle 5-5237, 5-5212, 5-5213

BENNETT SPECIALS

36" Bullard Mill, Spiral Dr., 4 Jaw
4" bar Universal Table Type Mill, 60" spin. to table, 96" spin. to outer support, '42.
3½" & 4" Landis Floor Type Mills
3" bar Yoder, Table Type Hor. Mill, 30" spin. to tble., 72" spin. to outer support
48"x20' centers N.B.P. Lathe, Grd. Hd.
36"x32" bed Niles Lathe, 2 carr., T.A.
7' Carlton 17" col. Radial, 1943
Nos. 3, 4, 3 & 3 W. & S. Turrets, Late
No. 4 Gisholt Univ. Turret Lathe, 1942
2½" Acme Gridley RBB, Automatic, 8 spin.
1⅜" Conematic, 8 spin. (4)
#4H—12" Libby Slid. Bed Gap (5)
36"x36"x11' Cinci. Hypro Planer, 4 hds., Var. Voltage, 1943
24"x24"x16' Ingersoll Planer Type Miller, 4 hds., 20 H.P. AC, M.D.
16"/18½"x54" cc Springfield T.A. '44
#9 DT Potter Johnson Automatics (2)
48" N.B.P. Slotter, Grd., Late
15'x3½" Wickes Rolls, M.D.
42" & 36" King, Side Hd., (2) '43
2½" bar #25T G & L Table, '43
18"/20½"x54" cc LeBlond, 1943
16"/18½"x54" cc Reed Pr., 1942
3' Fosdick 11" col., late, 1943
#65 New Britain Gridley, 6 spin., '43
#36 Van Norman Miller, 1944
Index Miller, Univ., late
1½" New Britain Gridley, 6 spin., late (2)
24"x24"x86" Rockford Planer-Shaper
42"x42"x10' Cleveland Open Planer
ML16 Duall Saw, late

BENNETT MACHINERY CO.
30 Church St., New York 7, N. Y.

AUTOMATICS

#9G B & S, late type
1½" & 1⅝" 8 Spdl. Cone, late
9/16", 1", 1¼", 1⅝", 2", 2¼", 2⅝" Acme Gridleys, late
2¼ & 2⅝" Cone 6 Spdl., late
12" and 16" 8 Spdl. Bullard Multaumatics, late

PRESSES

2000 ton Bliss Hydr., 3 col. type, 12" str., 50½" sht. ht., dia. bed 115"
60 ton Dbl. Crank, 5" stroke, 48x24 bed, late model Waterbury Farrel
90 ton Dbl. Crank, 8" stroke, 48x18 bed, late model Bliss
35 ton 4, 5, 6" stroke, latest type, w/all accessories, Bliss $850.00 ea.
70-85 ton 4" stroke 21 x 27 bed, 110 strokes per min., Bliss, latest type
90-125 ton 4½" or 5" stroke, 60, 80, 110 (optional) strokes per min., late type
Inclinable, New, 20 to 70 ton, immediate delivery
375 ton Elmes, 12" stroke, 84x54 bed, late type
350 ton Elmes, 20" stroke, 36x45 bed, late type
250 & 750 Baldwin, 144x48 bed, 40" stroke
#305 Bliss, 12" stroke, late

TURRET LATHES

#3 & #5 Warner & Swasey, late type, lots of tooling
#4FU Fastermatic, 4" cap., late type
#3HB Libby Sliding Bed Gap, 8½" cap., late type

PAUL'S MACHINERY COMPANY
MONA MEMBER
6111 Vermont Avenue
Detroit 8, Michigan
TYLER 7-6300

BORING MILL: Defiance #25A horizontal 3¾" bar, 1940
BRAKE: Versen press 10'x¼", 170 ton
DRILL: Edlund #4B-12" single spindle
DRILL: Kingsbury single spindle horizontal, index fixture
GRINDER: Cincinnati #3 centerless, 1942
GRINDER: Landis type C hydraulic 6 x 30
HAMMER: Chambersburg 1000 lb. pneumatic forging, 1946
HAMMER: High Speed #5A Riveting, ⅜" to ½"
LAPPER: Cincinnati centerless, 1944
LATHE: Sidney 18" x 11', motor on base, will swing 21½", 78" between centers, 1941
LATHE: South Bend 36" x 8', 54" between centers, MD
LATHE: Fay & Scott gap, 54" x 82" x 8', gap opens 24", plain change
LATHE: Sundstrand model 8 automatic, serial #88-1021
LATHES: 5 quick change from 20" to 27" swing x 10½ ft. to 14 ft. between centers
MILLER: K & T #3H plain horizontal, 1941
MILLER: Cincinnati #2MH universal horizontal 1942
MILLER: Cincinnati #5 plain horizontal, SPD
MILLER: Cincinnati 48" automatic duplex, MD
MILLER: Waltham thread 2" x 12", 1943
PLANER: Cincinnati 30" x 30" x 10' single head
PRESS: Johnson 50 ton OBI 5" stroke
PRESS: Bliss Consolidated #8 140 tons, OBI
PRESS: Hannifin 20 ton vertical hydraulic
SCREW MACHINE: B & S #0 wire feed, hand

JOHNSON MACHINERY CO.
59 Edison Place, Newark 2, N. J.
Mitchell 3-7608

No. 4 Cinn. Vert. High Power Mill, M.D.
No. 13 B & S Universal Grinder, M.D.
No. 6 W & S Turret Lathe, M.D.
No. 2 HL Milwaukee Univ. Mill, 1945.

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Bor. Mill, Her. 3" G and L., MD.
Boring Mills, 24"-30"-42"-52"-72"-96"
Drills, Radial 3'-4'-5'-6' Cin.-Bick.
Lathe, Turret 3-A W and S, S.P.D.
Millers, Plain No. 3 K and T, No. 4 Cin.
Millers, Vertical No. 3 B and S and No. 4 Cin.
Shaper, 10"-20"-24"-36".
Shaper, 36" Morton Draw Cut.
Squaring Shear, Niagara 11'x10 gauge

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NEW and USED — HAND and POWER. Apron Brakes, Press Brakes, Shears Forming Rolls, Power Presses, Pittsburgh Lock Machines, Spinning Lathes, Spot Welders, etc.

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VERTICAL BORING MILLS

24" Bullard
30" Warner & Swasey
36" Bullard
42" Bullard
51" Niles Bement Pond
72" Niles
72" Colburn
78" Betts
100" Betts
12' Betts

HORIZONTAL BORING MILLS

Table Type

3A DeVlieg Jig Mill
No. 0 Giddings & Lewis 3⅛"
No. 31 Lucas
No. 41 Lucas 3"
No. 42 Lucas 4"
No. 1 Cleveland 2½"
Universal 3½"
7" Detrick & Harvey

HORIZONTAL BORING MILLS

Floor Type

Rochester 3½"
No. 1½ Giddings & Lewis 4"
No. 35 Landis 3½"
No. 40 Landis 4"

SHAPERS

16" American
24" Gould & Eberhardt
24" Ohio
24" Cincinnati Universal
32" Averback
36" Ohio Universal

SLOTTERS

6" Jones
6" Newton
18" Putnam
26" Betts
36" Niles Bement Pond

PLANERS

24" x 24" x 6' Liberty — Openside
36" x 36" x 8' Cleveland — Openside
42" x 42" x 12' Cleveland — Openside
56" x 56" x 10' Liberty — Openside
48" x 48" x 10' Niles Bement Pond — D.H.
50" x 16' Cincinnati — D.H.
72" x 72" x 36' Betts — D.H.
84" x 72" x 12' Cincinnati — D.H.
84" x 84" x 24' Putnam — D.H.
98" x 74" x 27' Niles Bement Pond — D.H.

DRILLS

Multiple Spindle (Vertical)

No. 2-AL Natco—2 Spindle Rotary Table
No. 11 Natco
No. 11 Natco Straight Line
No. C-12-H Natco — Hyd.
No. 13 Natco
No. C-8 Natco — Table Feed
No. 30 Natco
No. 22-AC Fox Hyd.
No. 14 Natco
No. 85B Natco Hole Steel Mult. Drill

DRILLS

Horizontal

Davis & Thompson—Opposed Type
Ingersoll Hyd. — Opposed Type
Ingersoll Hyd.—Single End—Rotary Table
Rockford 5 spindle with Rotary Table
Natco Two Way Opposed
Natco Two Way Opposed, Hyd.
Baker Opposed—Boring & Drilling
Colburn Opposed—Boring & Drilling
Snyder Opposed—Boring & Drilling

PRESSES

No. 33P Toledo — Solid Back
No. 94 Bliss — Solid Back
No. 5 L & J — O.B.I. — 45 ton
No. 605 General Flexible — 60 ton
No. 75 Lawtonmatic Hydr. — 75 ton
No. 667 Toledo Knuckle Joint — 1200 ton
No. 668 Toledo Knuckle Joint — 1500 ton
H. P. M. Hydr. Hobbing — 2000 ton

ENGINE LATHES

American 12" x 5'
Lodge & Shipley 12" x 5'
Lodge & Shipley 12" x 6'
South Bend 13" x 4'
Lodge & Shipley 14" x 5'
Bradford 14" x 6'
Hendey (Yoke Head) 14" x 6'
Hendey 14" x 6'
Monarch 14" x 8'
Hendey 16" x 6'
Pratt & Whitney 16" x 6'
Lehman 16" x 7'
Monarch 16" x 7'
Monarch 16" x 10'
Pratt & Whitney 16" x 8'
Hendey 16" x 8'
American 18" x 8'
Lodge & Shipley 18" x 60"
American 20" x 8'
Hendey 20" x 8'
Prentice 20" x 10'
Sidney 20" x 10'
Hendey 20" x 12'
Sidney 20" x 12'
Hendey 20" x 48"
Lodge & Shipley 20" x 72"
Monarch 20" x 72"
Axelson 20" x 91"
Le Blond 21" x 8'
American 24" x 22'
Axelson 25" x 72"
Bridgeford 26" x 10'
Lehman 27" x 38'
Lodge & Shipley 30" x 12'
Bridgeford 30" x 30'
Bridgeford 32" x 14'
Bridgeford 32" x 16'
Schumacher & Boye 32" x 16'
Le Blond 36" x 18'
Lodge & Shipley 36" x 18'
Niles Bement Pond 36" x 18'
Houston-Stan.-Gamble 54" x 18'
Bridgeford Boring Lathe—2 Carriage 48" x 58'

UNUSUAL ITEMS

Bridgeport Opposed Spindles, Spline Millers
10" x 168" Pratt & Whitney Thread Mill
No. 24-L-36 Bryant Grinder
16" x 48" Cincinnati Univ. Grinder
No. 2 Cincinnati Centerless Grinder
No. 3 Cincinnati Centerless Grinder
Cincinnati Monoset Cutter & Tool Grinder
No. 1-A Davis & Thompson Rotary Mill
No. 153-84 Gardner Hor. Disc Grinder
6" x 36" Jones & Lamson Auto. Thread Grinder
48" x 48" x 10' Ingersoll Vert. Planer Type Mill
21" x 48" Landis Crankpin Grinder
12" x 16" x 60" Mattison Surface Grinder
Newton Type V4 Rotary Mill
10" x 96" Norton Pl. Cyl. Grinder
84" Thompson Broach Grinder
No. 1806 Cincinnati All Steel Squaring Sheer

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AUTOMATICS

No. 0G Brown & Sharpe.
⅝" National Acme.
⅞" Cone 4 spindle bar.
1⅛", Cleveland "M" 4 spdl. bar.
1¼" Cone 4 spindle bar.
1⅝", No. 61 New Britain Gridley.
1⅞" Conomatic 8 spdl.
2"x18" Cleveland Model "B" bar.
No. 454 New Britain chucking.
14"x19" Fay chucking.
14"x18" Monarch Magnamatic.
No. 2F Foster Fastermatic.
8" Bullard Multaumatic.
Economy Automatic Shaver.
15"x22½" Sundstrand auto. stub lathes.
1" Economy auto. bolt head shaver.
No. 5D2 Potter & Johnston 2 spdl.

BORING MACHINERY

2½" No. 25 Giddings & Lewis
3" bar Universal horizontal.
3" bar No. 31 Lucas horizontal.
3¼" No. 32 Lucas horizontal.
3½" bar, No. 5A Defiance.
4½", No. 33 Lucas horizontal.
7" bar Barrett cylinder boring machine.
100" Niles-Bement-Pond, heavy pattern.
30" Bullard single turret.
52" King vertical.
24" & 42" Bullard vertical.
Munson double end.
Vernon vertical jig borer.
Pratt & Whitney jig borer.
No. 42 Heald Borematic, 2 spdl.
Nos. 47, 47A & 48A Heald Borematics.
No. 2112 Excello precision.

BROACHES

Twin Ten Oilgear hydraulic.
No. 3XA Oilgear hydraulic.
No. 1 Foote Burt duplex surf.
No. 3 Lapointe screw type.
9 ton American surface.
40 ton, No. V48 American vert. hydr.
2 ton American vert. hydraulic.

DRILLS, RADIAL

3' Morris.
4' Cincinnati Bickford Universal.
4' American triple purpose.
4' Hammond types G & D.
6'-15" Cincinnati Bickford.
6'-15" Dreses.
7' American triple purpose.

GEAR MACHINERY

Type T Barber Colman hobber.
No. 5 Barber Colman.
No. 12 Barber Colman, PRT.
No. 6 Fellows gear shaper.
No. 130 Cleveland sql. spdl. Rigidhobber.
No. 8H G. & E. Univ. hobbers.
No. 12H G.&E. Univ. hobbers.
16HS Gould & Eberhardt Type B spur gear hobber.
8'-10" No. 1 Lees Bradner Production hobber.
No. 5M Adams Mfg. Hobber.
14" Nos. 5A & 5AC Lees Bradner hobbers.
24"x12" Flather automatic spur.
Cimatool Peerless chamferer.
National Tool Co. Involute Gear and Gear-cutter Checker, Model B.
2 spdle. Lipe gear tooth rounder.
10" Pratt & Whitney hyd. gear grinder, 2-wheel model.
18" Gleason bevel gear testers.
18" Gleason bevel gear lappers.
18" Gleason combination testing & lapping.
Red Ring gear lappers.
Model HRS Barber Colman hob grinder.
"MAL" Barnes Hut-O-Lap gear lapper.
12" Red Ring gear shaver.

GRINDERS, CYLINDRICAL

6"x14" No. 10 Brown & Sharpe.
6"x18" Landis type C.
6"x18" Norton type C, hydraulic.
6"x18" No. 10 Brown & Sharpe
12"x30" No. 2 Brown & Sharpe univ.
6"x32", No. 11 Brown & Sharpe.
10"x18" Landis "C" hydraulic.
10"x18", 10"x30", 10"x36" and 10"x50', Norton.
10"x20" Brown & Sharpe No. 1 univ.
10"x24" Landis hydraulic universal.
10"x24" Landis mechanical.
No. 13 Brown & Sharpe universal.
10"x36" Norton hydraulic.
10"x36" No. 2½ Bath Universal.
10"x36" Landis universal.
14"x36" Landis "C" hydraulic.
16"x36" Landis type D.
16"x72" Landis mechanical.
23"x36" Norton type C, hyr. in feed.

GRINDERS, DISC

15" No. 115 Gardner opposed disc.
16" Hanchett opposed disc.
26" No. 226 Gardner single or double disc.
30" No. 86 Gardner horiz. disc.
30" No. 230 Hanchett opposed disc.
53" No. 372 Besly horiz. disc.
Nos. 00 & 1 Osterholm oscillating grinder.
8" Vertical M.D. horiz. disc grinder.

GRINDERS, INTERNAL

No. 72A5 Heald hydraulic with cross sliding head.
No. 72A5 Heald plain with extended bridge.
No. 72A3 Heald plain with cross sliding head.
No. 72A3 plain with facing attachment.
No. 72A3 Heald Sizematic centerless.
No. 72 Heald Sizematic int.
No. 74 Heald internal.
No. 75 Heald internal.
No. 75A Heald internal, cross feeding head.
Size 1G Grenby internal qdr.
No. 42 Van Norman radius.
No. 16 A16 Bryant int. & facing.
No. 16 CP16 Bryant.
No. 16-26 Bryant.
No. 16-36 Bryant.
No. 24-36 Bryant.
MH1 Sav-way hydraulic feed.

GRINDERS, SURFACE

30" No. 16 Blanchard, 25 HP motor.
16" No. 10 Blanchard surface.
16" and 24" No. 25A Heald rotary.
12" & 16" No. 22 Heald rotary.
12" No. DB Walker rotary vert.
8" Pratt & Whitney vert. rotary.
8"x22" No. 3 Abrasive.
8"x24", No. 34 Abrasive vert. spdl.
8"x24", No. 3 Wilmarth Morman.
10"x24" Norton hydraulic.
12"x16"x48" Thomson hydraulic.
14"x36" Pratt & Whitney vertical.
14"x60" Mattison hydraulic.
24"x48" No. 2 Springfield planer type.
Nos. 00 & 1 Osterholm oscillating type.

LATHES, ENGINE

9"x17" centers Hardinge precision.
No. 9 Cataract.
No. 5½ Sloan & Chace Precision.
14"x30" Sebastian geared head.
14"x6' Lodge & Shipley qrd. hd.
14"x6' bed Mulliner.
14"x8' American geared head.
16"x6' Monarch qrd. head.
16'x8' Porter McLeod.
18"x8' Rockford.
20"x8' Lodge & Shipley.
36"x16' Bridgeford qrd. hd.

MILLING MACHINES, PLAIN UNIVERSAL, VERTICAL

Vernon vertical miller and jig borer.
Fray All Angle vertical, hydr. feed.
No. 2-AS Milwaukee plain.
No. 3B Milwaukee plain.
No. 4B Milwaukee plain.
No. 12 Garvin plain. Cheap.
No. 2M Cinci. vert. with rot. table
No. 2 Cinci. vert. with rot. table.
No. 2M Cincinnati vertical.
No. 2H Milwaukee vertical, rotary table.
No. 3 Cincinnati vertical HSDT.
No. 3V Van Norman vert.
No. 3H Milwaukee vertical.
No. 3 Kempsmith Maximiller vertical.
No. 4H Kearney & Trecker vertical.
No. 4 Cincinnati high power vert.
No. 3 Van Norman duplex.

MILLING MACHINES, MISCELLANEOUS

No. 0-8 Cincinnati horizontal.
No. 0-8 Cincinnati Rise & Fall.
No. 0-8 Cincinnati vertical.
No. 2-24" Cincinnati automatic.
No. 1-12 Cincinnati automatic.
No. 1-18" Cincinnati automatic.
No. 2-18 Cincinnati automatic.
Nos. 2-18 & 2-24 Cincinnati, rise & fall.
No. 3-24 Cincinnati Hydromatic.
No. 3-36 Cincinnati duplex hydromatic.
No. 18-36 Kearney & Trecker duplex.
No. 4-36" Cincinnati Hydromatic.
No. 4-48 Cincinnati Hydromatic, high column with hyd. vert feed.
No. 5-48" Cincinnati Hydromatic.
34-36 Cincinnati Hydromatic.

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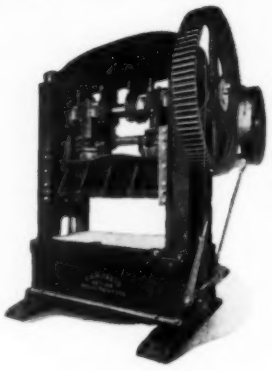

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Two D Connally Boilers, 380 HP each, approved steam pressure, 200 pounds gauge. Each boiler has four foot by one hundred fifty foot stack. The boilers are equipped with Copes Feed Water Regulators, and all instruments necessary for efficient operation. The boilers are equipped with two Cax stokers, made by the Combustion Engineering Corporation, and are in excellent condition. An American Blower, size 5, type H5, No. 2678 is used for force draft for these stokers.

Two Reciprocating Worthington Boiler Feed Pumps are furnished, size 14"x8½"x15".

The boilers are not equipped with Super Heaters.

All steam piping is included inside the boiler house.

A Skip Hoist, for hoisting fuel, is also furnished, and is in excellent condition.

Two fuel bins, steel construction, are available, one for each stoker.

The boiler house construction is of all steel, and corrugated iron sheeting; approximate size 60 x 60 ft.

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Lees Bradner CT 30" Thread Millers
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6 sp. Baird Chucker 15 HP AC Motor Drive
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TOGGLE DRAW PRESSES

BLISS No. 5A Toggle Draw Press. Single Crank, Tie-rod Frame, Friction Clutch. 8" Dia. Crankshaft, Motor Driven. "Will Draw and Lift out 12½".

BLISS Nos. 1½, 1½B, 3½A, 3½B, 3½C, 4, 4A & 16
CLEVELAND No. 18T—10"—15" Strokes
TOLEDO No. 164½—8½—13" Strokes

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BLISS No. 16, 19, 19C, 20, 20B, 21, 21½ & 23
CALLAHAN No. 5—Motor Drive (New)
FERRACUTE Nos. C4 and C5
NIAGARA A-3 Geared, Motor Drive
STANDARD Nos. 8S and 10S
V & O Nos. 00, 0, 01, 1, 2, 4, 101, 102, 103 & 104, Flywheel & Geared. Some with Dial & Roll Feeds
ZEH & HAHNEMANN Nos. 36-4 & 36-5

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BLISS-STILES No. 2, 3, 4 & 5
BLISS-TOLEDO No. 77 & 78 Geared
FERRACUTE P-1, P-2, P-3, P-4, P-5 & PG-6, MD
MICHIGAN Deep Throat Punches 30" & 36"
TOLEDO Nos. 15 & 17 Deep Throat
V & O 2-00 High Speed, M.D.

DOUBLE ACTION—CUT & DRAW

ADRIANCE Nos. 44 & 45 Strip & Roll Feeds
ADRIANCE 16 Die Crown Cap Press
BAIRD No. 3 Tandem Roll Feed
BLISS No. 1, 1½B, 3½, 6, 6 & 7 Cam & Crank
TOLEDO No. 68 Geared
V & O No. 10, 11 & 15 with Roll Feeds
WATERBURY-FARRELL Nos. 1, 2, 2½ with Feeds
WATERBURY 5 T. Hi Sp., Roll Feed and Scrap Cutter

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BLISS 675 HI-SPEED, New 1946, Roll Feeds
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BLISS Nos. 304, 305 & 307½ (New in '42, '44)
FERRACUTE E-3 & E-4 with Roll Feeds
FERRACUTE DG-53 & DG-54 Geared
FERRACUTE D 251 Twin-geared 250 Ton, Friction Clutch with New Air Cushion
NIAGARA No. 510 Geared with Side Shear
TOLEDO No. 59¼, Twin Flywheel Forging, 400 Ton

NEW BLISS No. 703 Flat Edge Trimming Press

DOUBLE CRANK

TOLEDO 94½G Dbl. Cr., Twin Gear, Tie Rod Frame, Bed 38"x84", Cr shaft 7" Pins 8", A.C. M.D.

BLISS 5A—42" x 30", 5C—54" x 30" Geared, Tie-rod Frame A.C. Motor Drive
BLISS Nos. 105, 105B & 106 Transfer, Gap Type
FERRACUTE 36" & 52" Geared
NIAGARA No. 62C—48"x30", Geared Spring Cushion
TOLEDO 92B—42"x30" & 93C—48"x36", Tie-rod Frame, with Air-Cushion, Geared, M.D.
V & O 84"x20" with Dbl Roll Feed & Scrap Cutter
WELLS Nos. 6—76" & 10—84" Gang Punches
WILLIAMS & WHITE No. 34 Gang Punch, M.D.

KNUCKLE JOINT & PERCUSSION

BLISS 3K—50 Ton Geared M.D.
FERRACUTE EG-52 Geared, 150 Ton, M.D.
WATERBURY 320 Ton, Geared, Steel Frame
ZEH & HAHNEMANN No. 5, 7 & 10

WILLIAMS & WHITE 29U Bulldozer

HORNING & WIRING

ADRIANCE Nos. 23, 24
BLISS Nos. 16, 39, 40 & 41 Adj. Tables
BLISS No. 2W Geared, Friction Clutch
FERRACUTE Nos. CA-4 & CAG-4 Motor Driven

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EYELET PRESSES Nos. 510, 156 & 1510
No. 2½ Cut & Carry with Roll Feed, M.D.
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SLEEPER & HARTLEY UNIVERSAL SPRING COILERS Nos. 00, 1, 2, 3, 3½, 4 & 5
SLEEPER & HARTLEY SPRING LOOPERS & SETTERS
TORRINGTON Univ. & Torsion Coilers
WELLS SPRING MACHINERY, COILERS, KNOTTERS & CRIMPERS
LEWIS, SHUSTER, WELLS AUTOMATIC WIRE STRAIGHTEN & CUTTING MACHINES, CAPACITY 1/16" to ⅞"
LEWIS No. 4F Travel Cut Straightening & Cutting
ARTOS Wire Cutting & Stripping Machines
NILSON Automatic Chain Machines
NATIONAL & PERKINS Nail Machines
Automatic Barbed Wire Machine
VAUGHN No. 12 Single & Double Deck Motoblocs
WATERBURY Nos. 3 & 4 Bull Blocks
WATERBURY No. 0 Sleeve type Continuous for Alum & Copper Rod, 7 Die, 20 H.P., M.D.
WATERBURY FARREL Nos. 0 & 1 Slip Roll, No. 1 Stop Cone & 6 & 8 Die Upright Continuous Wire Drawers (Blocks & Spoolers)
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UNITED ENGINEERS 6"x14" & 8"x10"
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NATIONAL 3/16" to ¼", ⅝" & ⅞" Auto. Bent Shank Nut Tappers (Standard & Precision)

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BLISS, NIAGARA, QUICKWORK, MARSHALLTON, DEEP THROAT & THROATLESS Shears
NIAGARA Nos. 180 & 15 Ring & Circle Shears
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LITTELL 8" CAP. STRIP STRAIGHTENING & CUTTING

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BLISS, ADRIANCE 28" & 36" Gang Slitters
TORRINGTON 48" Slitter with Take-up
WATERBURY, PEXTO, & NIAGARA SINGLE CUT
WATERBURY Nos. 1—12" & 1—18" Gang Slitters with take-ups

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NEW McKINNEY 8 Stand Roll Former, M.D.

RAFTER 5 Stand Duplex, Door Bucks
YODER 10 Head 2½"x12", M.D.
PITTSBURGH 4 & 5 Stand Tube Formers
WATERBURY-FARREL 4 Stand Former

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CINCINNATI 50 Ton 72" & 96", New '42
VERSON 40 Ton—48" & 150 Ton—10'
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ELECTRIC SPOT & BUTT WELDERS IN STOCK 5 to 700 KVA—Taylor, Federal

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BLISS & NIAGARA Power Beaders & Flangers
BLISS & V & O Thread Rollers & Trimmers
BLISS Double & Lock Seamers
CAMERON Body-makers up to 1 Gallon Size

MISCELLANEOUS

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STANDARD Automatic Drop Hammers
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PINES ENGINEERING Tube Trimmers & Threaders, Single & Double End
LANDIS 2" & 4" Pipe, Nipple & Bolt Threaders
MURCHEY Tube & Pipe Cutters, M.D.
PRODUCTION MACH. Tube Polishers, Centerless
FOX F-50 Ton Hyd. Press, New '46 Gap Type
SHERIDAN 37" & 44" Die Cutting Machines, M.D.

MACHINE TOOLS

BORING MILLS

BARRETT 3¼" Bar—Table Type
CLEVELAND 2½" Bar Table Type
FISHER 5" Bar Floor Type, AC—DC Drive
LUCAS #43 Precision—Bar Table Type, M.D.
COLBURN 48" Vertical, 2 Heads, M.D.

DRILLS

BAUSCH 12 Spindle Multiple Cap. 1½"
CANEDY-OTTO 4' Radial, Motor on Arm, New 1944
CINN-BICKFORD 5'11" Radial Drill M.D.
FOSDICK 3½' 9" Radial Drill M.D.
LELAND GIFFORD 24 Spindle, Power Feed

PLANERS

WOODWARD & POWELL 42"x42"x36"—4 Head M.D.

CINCINNATI 36"x36"x16' Box Table, 3 Heads, M.D.
GRAY 24"x42"x8' Widened Pattern, 2 Heads
NILES, BEMENT, POND 72" x 72" x 28' M.D., 4 Heads
SELLERS 38"x36"x9'—4 Heads

TURRET LATHES & AUTOMATICS

LIBBY 4H—SLIDING BED, GAP, 32" SWING 12½" HOLE IN SPINDLE, 25 HP AC MOTOR, 84" SWING IN GAP, NEW '43

BROWNE & SHARPE No. 1 Hand Turret New '41
WARNER & SWASEY No. 3A, 4 & 5 Hand Turret
JONES & LAMSON 1½" Bar Universal, New '42
NEW BRITAIN & GRIDLEY Automatics—1" & 1¼"
BROWNE & SHARPE No. 2G Automatics New '41

GRINDERS

PRATT & WHITNEY 14" VERT. SURFACE, HYDRAULIC FEED, MAG. CHUCK, NEW '43

BROWNE & SHARPE & REID No. 2 Surface
HEALD #22 Rotary Surface—12" Chuck, New '43
NORTON 10"x36" Hydraulic, M.D. Perm. Chuck
HEALD No. 81 Sizematic, New '42
GARDNER No. 14 & 115 Twin-Wheel Opposed

SHAPERS

CINCINNATI 20" Motor Driven
CINCINNATI 36" Planer Type with Grind. Attach.
GOULD & EBERHARDT 16" & 20" Back-Gear, M.D.
SMITH & MILLS 24" Back-Geared, M.D.

LATHES

AMERICAN 27"x10' Geared Hd., T.A., M.D.
DRAPER 27"x16' Geared Face Plate Drive
HENDEY 14"x6' Quick Change, Taper Attachment
LE BLOND 16"x12' Q.C., M.D. Full Equip.
LODGE & SHIPLEY 24"x14'—12 Speed Head, M.D.
McCABE 2 Spindle 24"—46"14'
SIDNEY 14" x 30" 16 Speed Head, Tool-Room Lathe. Taper Attachment, Collets, Chucks, Coolant, New '43
WALCOTT 20"x12', Q.C.G., M.D.

MILLERS

BROWNE & SHARPE No. 2A Universal, M.D. Full Equip. Heads, Vise, & Vertical
CINCI. Nos. 2, 3, 4 Plain & Universal & Vert.
KEMPSMITH No. 3 Universal, Full Equip., M.D.
VAN NORMAN No. 21 Duplex, M.D.

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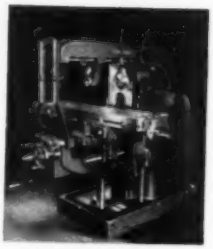

• LATHES

16"x30" SIDNEY Timken Head, T.A., Motor in Base
16"x54" LE BLOND Toolroom, T.A., Chucks, Collets, 1943
18"x48" SIDNEY Timken Head, T.A., Motor in Base
18"x72" LODGE & SHIPLEY 12 speed Selective Head, T.A., M.D.
20"x62" AMERICAN High Duty 12 Speed Head, T.A., M.D.
25"x72" LE BLOND 12 speed Head, T.A., M.D.
30"x54" AMERICAN 12 speed Head, M.D.
48"x20' cc DRIGGS (New Haven) Geared Head, M.D.

• TURRET LATHES

No. 3 BARDONS & OLIVER Univ., 1943
No. 4 GISHOLT, bar feed, M.D.
No. 918 RIVETT Screw Machine
No. 2G BROWN & SHARPE Ser. 6260

• MILLING MACHINES

No. 3 CINCINNATI Universal, Full Equip., M.D.
No. 3B BROWN & SHARPE Plain, Hi-Speed, Timken Spindle, Double overarm, motor in base
No. 4 CINCINNATI Dial Type, Vert. Head, 1941
No. 1224 K & T Simplex, 1944

• PLANER TYPE MILLING MACHINE

42"x42"x12' INGERSOLL Adj. Rail Planer Type Miller, 4 heads, 25 HP motor.

• PLANERS & SHAPERS

36"x36"x12' CLEVELAND Openside, 3 heads, M.D.
42"x42"x16' G.A. GRAY D.H., 3 heads, M.D.
16" GOULD & EBERHARDT, Factory Gear Box, M.D.
32" OHIO Heavy Duty Downfeed, 1942
36" OHIO Extra Heavy Duty, 1943

KELLER DUPLICATOR

TYPE BG 1-482 PRATT & WHITNEY AUTOMATIC TOOLROOM DUPLICATING MACHINE, ARRANGED FOR THREE DIMENSIONAL OPERATION WITH ANGLE FIXTURES AND COMPLETE CONTROLS. NEW 1944.

• RADIAL DRILLS

3' AMERICAN Triple Purpose, 10" col., M.D.
5' CARLTON 17" col., 1943
6' CINCINNATI BICKFORD, 15" col., Motor on Arm
6' CARLTON 17" col., Motor on Arm

• BORING MILLS

53" NILES BEMENT POND, 2 swivel heads, Rapid Traverse, M.D.
84" CONSOLIDATED COLBURN 2 swivel heads, Rapid Traverse AC Motor Drive
No. 21 LUCAS Hor. Boring Mill, 2¾" bar, M.D.
No. 32 GIDDINGS & LEWIS, 3¼" bar, M.D.

• SHEARS

6'—16 ga. PEXTO, 18" gap., M.D., 1943
10'—3/16" BERTSCH, 20" gap, M.D.
10'—¾" WILLIAMS & WHITE, 24" gap, M.D.

• GEAR MACHINERY

No. 5 NEWARK Universal Gear Hobber
No. 3 FELLOWS Straight Line Gear Generator

• GRINDERS

6"x18" CINCINNATI Cylindrical, Filmatic Bearings, Hyd. Infeed, 1942

"The most important part of a MACHINE TOOL is the COMPANY that stands behind it"

O'CONNELL MACHINERY CO.

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The Company that lists prices for all machines advertised

Late Type Machines — Priced Right

AUTOMATIC, 00G B&S 16000 ser. (1944) $2950.00
AUTOMATICS (2), 2G B&S 12,000 serials 1" cap. ('45) ea. 3950.00
AUTOMATICS, 2½" Cleveland Model B ('42) 3250.00
AUTOMATICS (2), 3¼" Cleveland Model A (1942) ea. 4950.00
AUTOMATICS, 1⅝" Conomatic 8 sp. (1943) 5500.00
AUTOMATICS (5), #60 New Britain 6 sp. (1945) ea. 4250.00
AUTOMATICS, 1⅝" Greenlee 4 sp. (1942) 3500.00
AUTOMATIC 2⅝" Greenlee 4 sp. (1941) 6500.00
CRANE, 3 Ton Shepard, 28' span (1943) 1500.00
DRILLS, (5), #16 Canedy Otto Royal M.D. (1943) ea. 175.00
DRILL, 3 Sp. Leland Gifford ILMS (1943) 695.00
DRILL, 4 Sp. Foote Burt (1943) 1995.00
GEAR SHAPER, Fellows 725 (1943) 2250.00
GEAR GRINDERS, 9" Pratt & Whitney (1943) ea. 995.00
GEAR GRINDERS, (4), 10" Detroit (1943) ea. 995.00
GEAR LAPPER, National Broach 15" Road Rims (1941) 1750.00
GRINDER, Surface, Delta 6" x 18" M.D. (1947) 395.00
GRINDER, Cincinnati 6"x18" Cyl. (1942) 1450.00
GRINDER, 6 x 30 Cincinnati Cyl. M.D., (1945) 4500.00
GRINDER, Brown & Sharpe No. 5 Cyl. (1943) 1475.00
GRINDER, Cincinnati No. 2 Centerless (1945) 4250.00
GRINDER, Heald No. 72A3 Gagematic (1939) 1750.00
GRINDERS (2), Heald No. 74 Int. Centerless (1943) ea. 2450.00
GRINDER, Abrasive No. 3 Surface (1939) 995.00
GRINDER, Landis 18-Inch Radial Cam (1944) 2950.00
LATHE, Carroll Jamieson 16"x8' (1942) 1750.00
LATHE, LeBlond (3"x8' Rap. Prod. (1943) 1250.00
LATHE, Seneca Falls 8"x60" Low - Swing (1944) 2500.00
LATHE, Monarch EE 10"x20" (1943) 2450.00
LATHE, LeBlond 36"x60" Centers (1943) 4500.00
LATHES (2), Logan 820, cab, base M.D. (1943) ea. 375.00
MILL, #12 Brown & Sharpe, M.D. (1943) 1650.00
MILL, Van Norman No. 16CT Contour (1944) 3950.00
MILL, U. S. Multi-Mill MM-1 (1943) 495.00
MILLS (2), Cincinnati 00 Horiz. Rise & Fall M.D. (1942) ea. 1495.00
MILLS (5), Cincinnati 00 Vertical (1943) ea. 950.00
MILLS (6), 116 Van Norman (1943) ea. 950.00
MILL, Stokerunit No. 33 Prod. (1943) 1750.00
PLANER, Cleveland Openside 36x36x8 (new) 12500.00
RIGIDTURNERS (6), Cleveland Model 616 (1943) 2495.00
SAW, Racine Model 6, Hyd. 16" table ea. 975.00
SAW, Marvel 4B, (1943) 495.00
TAPPER, #2 Bakewell M.D. (1943) 1575.00
THREADER, 2½" Landmaco (1943) 1995.00
TURRET LATHE, Gisholt 1L, Bar feed (1939) 2950.00

Miscellaneous

AUTOMATIC, No. 2G Brown & Sharpe 675.00
AUTOMATIC, 2"x6" Cone 4 Sp. M.D. 1475.00
AUTOMATIC, 3¼" Cleveland Model A, 24,000 Ser. 975.00
AUTOMATIC 4½" Gridley S.S. M.D. 950.00
CRANE, Shepard 2½ Ton 47' Span 2500.00
DRILL, 36" Reed Prentice 450.00
ELEVATOR, Barrett 1000 lb. 30' Lift M.D. 950.00
GEAR SHAPER, 36" Fellows, M.D. 850.00
GRINDER, 6x32 Norton, M.D. 750.00
GRINDER, 10x52 Landis 750.00
GRINDER, Heald Rotary, 16" M.D. 750.00
GRINDER, Surface, No. 2 B&S, M.D. 475.00
GEAR HOBBER, No. 3 Barber Colman 495.00
LATHE, 14x6 Monarch M.D. 550.00
LATHE, 24x10 Greaves, Grd. Hd., T.A. 1475.00
LATHE, 36"x14' Houston, Grd. Hd., M.D. 1975.00
MILL, No. 5 Cincinnati Plain, SPD 1750.00
PIPE THREADER, 6" Williams M.D. 750.00
SAW, Wells Horiz., Band, M.D. 295.00
THREAD MILL, 6x18 Pratt & Whitney 695.00
TURRET LATHE, 2A W&S, Bar feed 750.00

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THOMPSON 12x48" trueform (crush) grinder. New. Never used.
EXCELLO No. 50 thread grinder (largest made) will grind 3" shaft any length through spindle, 68" length, 12" dia. on centers.
GLEASON No. 17 Hypoid gear grinder for spiral bevel, zerol, & hypoid gears and pinion, max. pitch dia. 23½".

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1722 Superior Ave., Cleveland, Ohio
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PRACTICALLY NEW

THOMAS 8' x 5/16" HEAVY DUTY POWER SQUARING SHEAR

MODEL 57, MANUFACTURED 1946, SERIAL #8643. One Set of Shear Blades in Machine. One Set of New Shear Blades Extra. Complete with 5 HP, 220/440 V. Motor.

ACTUAL USE SIX MONTHS

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MILWAUKEE 5 ton; 21' span; 220 volts DC
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Potter & Johnston 5 DE Machine
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Selections from our **JANUARY** *stock list*

GRINDERS

Surface

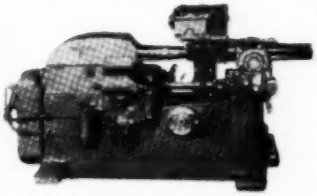
6"x18" NORTON Hydr. Hor. Surface.
No. 2 BROWN & SHARPE.
No. 15 G. & L., 6"x18", hand feeds.
No. 10 BLANCHARD Rotary, new 1937.
A3-12" ARTER Horizontal Rotary, 1943.
No. 25A HEALD ROTARY, 16". 1942.
No. 55 GALLMEYER & LIVINGSTONE Hydraulic, 12"x36" table. New 1943.

Cylindrical

4H LANDIS Plain 4" swing, 12" centers.
6"x18" NORTON Type C Hydraulic.
10"x24" LANDIS, Type C, Universal.
No. 30 BROWN & SHARPE, 10"x18".
10"x18" LANDIS, Type "C" Plain.
10"x18" NORTON Plunge Cut, "C".
14"x36" NORTON MultiPurpose Universal.
No. 2 CINCINNATI Centerless Grinders, Filmatic bearings. New 1943.

Internal

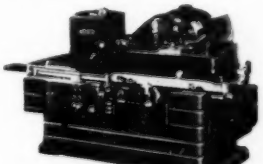
No. 81 HEALD, Sizematic-Gagematic.
No. 72A3 HEALD, cross sldg. head.
No. 72A5 HEALD, cross sldg. head.
No. 70A HEALD, motor dr., 1941.
No. 16-CR-16 BRYANT, large spdle. hole.



No. 24/36 BRYANT, for heavy work.

Thread

No. 35 EXCELLO, Universal, for external and internal work.



No. 35-L EXCELLO Universal, as above, for work up to 48" thread length.
No. 31L EXCELLO External, 36" length.

LATHES

18"x10' LODGE & SHIPLEY all geared.
20"x48" centers MONARCH Lathe.
30"x10' centers NILES "Timesaver".
Model Z MONARCH Magna Matic, 14"x 60" centers. New 1937. AC drive.
No. 12 GISHOLT Production Lathe.

TURRET LATHES

No. 3 GISHOLT ram type, latest style.
No. 3 WARNER & SWASEY Turret Lathe.
1L GISHOLT Cross sliding turret.
2L GISHOLT saddle type, latest type.
7A JONES & LAMSON saddle type. 1944.
No. 3A WARNER & SWASEY Turret Lathe.
3AL GISHOLT, cross sldg. turret.

MILLING MACHINES

1½B KEARNEY & TRECKER Plain.
No. 25 SUNDSTRAND Simplex Rigidmil. 72"x22" table. 27" travel. 1943.
No. 1 CLEVELAND Vertical. New 1942.
No. 2 CINCINNATI DT HS Vertical. 1942.
No. 4 CINCINNATI DT MS Vertical. 1942.
4-H KEARNEY & TRECKER Vertical.
6"x48" PRATT & WHITNEY Thread.
12"x36" LEES BRADNER "HT" Thread.

BORING MACHINES

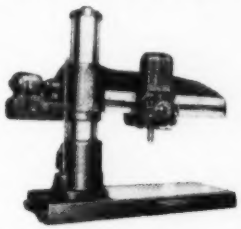
No. 47 HEALD Single End Borematics.
No. 49 HEALD Single End Borematics.
No. 49 HEALD Double End Borematic.
No. 45 HEALD Single End Borematic.
No. 45 HEALD Double End Borematic.

BORING MILLS

36" BULLARD Spiral Drive VTL.
54" BULLARD Maxi-Mill.
No. 41 LUCAS Horiz. Boring Mill, 3" bar.

RADIAL DRILLS

3'9" CANEDY OTTO, M.D., new 1942.



5'13" CARLTON, motor-on-arm.
6'15" CARLTON, late type, new 1942.
8'22" CARLTON, brand new, bargain.

THREADERS AND TAPPERS

No. 1R BAKEWELL Radial Tapper, 1943.
No. 2 BAKEWELL, up to 2½", 1943.
No. 5A (Lead Screw Type) KAUFMAN Tappers.

PLANERS and SHAPERS

72"x56"x32' CINCINNATI, box table, AC motor drive, 4 heads.
48"x48"x16' CLEVELAND Openside.
Two—20" CINCINNATI H. D. Shapers, 1942.
32" MORTON Draw Cut Shaper.

MISCELLANEOUS

V-36 DOALL Saw, new 1943.
No. 224A BARNES HONING MACHINE.
No. 4T and 6T SELLERS TOOL GRINDERS.
No. 36-S G. & E. Spur Gear Cutter.
10" P. & W. Spiral Gear Grinders.
6" BILGRAM Bevel Gear Planer.
No. S BARBER-COLMAN Gear Hobber.
No. 8B FELLOWS Gear Burnisher.
No. 2 KLING Single End Punch.

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Machine Tools

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CINCINNATI 12, OHIO
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LATE TYPE—READY FOR USE

MILLS

No. 3 CINCINNATI H.S. Dial Type Vertical
No. 2H KEARNEY & TRECKER Vertical
No. 30A FOSDICK Jig Borer
No. 2 PRATT & WHITNEY Jig Borer
No. 000 BROWN & SHARPE Production, M.D.
No. 1248 MILWAUKEE Simplex Production Mill 12"x65" Table, M.D.
No. M18 KEARNEY & TRECKER Production Mill
No. 8½D GORTON Vertical
No. 1 SUNDSTRAND Rigidmil Type A

LATHES

22"x72" MONARCH Model CM, 16 Speeds. Timken Bearing, T. A., Chucks, Collets, M.D.
16"x78" MONARCH Type CY, T.A. Collets, cks., coolant
14"x54" AXELSON Tool Room Lathe
16"x6' CARROLL-JAMIESON, G.H., Timken Bearing, M.D.
16"x10' CARROLL-JAMIESON, G.H., Timken Bearing, M.D.
18"x8' NEBEL, Geared Head, Timken Bearing
No. IL GISHOLT Universal Turret, Bar and Chuck, M.D.
Nos. 3 and 4 GISHOLT Universal Turret, Bar, Chuck
No. 5 GISHOLT Universal, Thread attachment
No. 3 & No. 4 WARNER & SWASEY Univ. Bar and Chuck

DRILLS

4'-11" AMERICAN Hole Wizard
4'-9" CINCINNATI-BICKFORD
4'-9" Col. MORRIS Mor-Speed, RA Base
4' WESTERN, Leader type, table & coolant
4'11" col. CARLTON Elec. col. clamp, table
6'-17" col. FOSDICK Radial Hyd. clamp. Univ. Box Table, Plain Box Table, Right Angle Base, M.D.
MA6 No. 3—3-Spindle AVEY, 12" O.H. No. 3 MT
MA6 No. 2—4-spdle. AVEY, No. 2 M.T., M.D.
MA6-No. 2 AVEY 12" O.H., 25"x34" table
No. 242 BARNES all-geared, 2" cap., No. 5 MT.

GRINDERS

No. 2 CINCINNATI Centerless, Bar feed att.
16"x17"x48"GALLMEYER & LIVINGSTON Hydraulic Surface Grinder, Type F, Chuck
No. 55 GALLMEYER & LIVINGSTON Hydraulic Surface Grinder, 12"x36", coolant, chuck.
14"x36" CINCINNATI Universal Hydraulic Grinder
6"x18" THOMPSON Hyd. Surface, Chk. and rect., M.D.
6"x18" NORTON Hydraulic Cylinder, Type C, Plain
No. 13 B. & S. Univ. Grinder. Fully equipped
No. 2 B. & S. Universal Grinder

MISCELLANEOUS

Type A & D BARBER COLMAN Gear Hobbers
No. 3120 NIAGARA Shear, 10', 10 ga.
No. 49 HEALD 2-Spindle Bore-Matic
No. ½ & No. 1½ BUFFALO Universal Ironworker.
No. ½ BUFFALO Vertical Bending Roll
25" SMITH and MILLS Shaper
9/16" RA6 ACME GRIDLEY Auto. Screw Machines, Chip Conveyor (2)
50-ton STECHER Die Screw Press
No. 12M MOREY 2-spindle Profiler

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18 SO. CLINTON STREET **CHICAGO, ILLINOIS**

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Nos. 2H & 3H K&T. Plain and Vert. Millers.
No. 4MS CINCINNATI Plain Miller
Nos. 5/60 & 45/48 CINCINNATI Hydromatic Millers
10"x20" MONARCH Toolmakers' Lathes.
16"x78" AMERICAN "Pacemaker" Lathe
50"x17' cc LeBLOND "Big Swing" Lathe.
12"x48" CINCINNATI "ER" Univ. Grinder.
10"x72" NORTON Type "C" Plain Grinder.
36" ROCKFORD Openside Hyd. Shaper.
3' 11" AMERICAN "Hole Wizard" Radial.
Nos. 3, 4 & 5 W.&S. Univ. Turret Lathes.
Nos. 385 J.&L. Univ. Turret Lathes.
No. 145 CLEVELAND Rigid Hobber.

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A HARD-TO-FIND MACHINE

MODEL Z FELLOWS HORIZONTAL GEAR SHAPER

Max. face width	5"
Max. Slide Movement	19"

3 motors. For cutting SPUR and HELICAL GEARS and CLUTCHES ON LONG INTEGRAL SHAFTS.

If you need machines for your jobs, standard or special, or want to convert your machines into cash—ask us to help you.

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PRACTICALLY NEW

=3-A LODGE & SHIPLEY DUOMATIC

Serial No. 36402, Complete with all equipment including 30 hp motor.

IMMEDIATE SHIPMENT FROM STOCK
EXCELLENT CONDITION

PRICE $4,250.00

WINSTON MACHINERY CO., INC.
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PORTABLE Jaeger—0 to 1000 r.p.m. Type A. in original carton and case. $17.50

HICKOK, ESICO, 0 to 4000 r.p.m. model 22 with generator and Boston reducing gear assembly. Panel mounting. 10" O.D. 8" dial. Specially priced @ $65.00

Hydraulic gauges—0 to 1000 psi. U. S. Gauge, 2½ A.D.—3571. ¼" standard iron pipe stem, male $1.00 in lots of 12, single units $1.50

War Surplus—0 to 2000, square plastic Hydraulic Pressure gauge — 2" sq. dial, single hole—female—$2.00 ea.

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ELECTRIC CRANES *and* HOISTS

N. B. PAYNE & CO., INC.

105 West 55 Street, New York 19
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No. 5H K&T Mill—(1942)—$9250.00
No. 2HL K&T Univ. Mill—(1942)—$4,475.00
2—No. 2HL K&T Plain—(1942)—$3,975.00
2—No. HO-18 Sundstrand Rgdn.—(43)—$1,750.00
1—No. 12 B&S Prod. Mill—(1943)—$2,150.00
No. 4 W.&S. Uni. Turret Lathe—(42)—$4,450.00
No. 3 Gisholt Uni. Turret Lathe—(43)—$2,750.00
No. 2 Cincinnati Cent. Grinders—(45)—$4,450.00

CHESEPEAKE 3-0343
ARTHUR MACHINERY SALES, INC.
816 W. LAKE ST., CHICAGO 7, ILL.

Three—=4K K&T Plain Mills, 1943.
4'x13" American Hole Wizard Radial Drill, 1942.
12"x54" Lees-Bradner HT Thread Mill, 1943.
50 Ton Henry & Wright Dieing Press.
14"x78" LeBlond Heavy Duty Lathe, 1942.
=2 Cincinnati Centerless Grinder, Infeed Att., 1942.

BARRON MACHINERY COMPANY
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MACHINE TOOLS
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METAL FABRICATING MACHINES
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HORIZONTAL BORING MILLS

No. 32 GIDDINGS & LEWIS 3⅛" Bar
4½" Bar NILES 33x60" Table
No. 33 LUCAS 4½" Diameter Bar.
No. 32 LUCAS 3¾" Diameter Bar.
No. 31 LUCAS 3" Bar.
5" OHIO Floor Type
4" LANDIS No. 40 Floor Type 5' Travel

VERTICAL BORING MILLS

48" NILES CARWHEEL BORER
72" COLBURN 68" Dia. Table, 2 rail heads
36" ROGERS side head, New 1943
36" ULLARD SPIRAL DRIVE
100" N.B.P. Rapid Traverse, 2 rail heads
42" KING, 42" CINCINNATI, 2 heads

VERTICAL MILLS

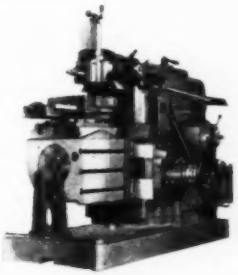
MODEL 1836 CLEERMAN JIG BORER
22x44" Tables, New 1942
No. 5 REED PRENTICE Vert. Mill & Die Sinker 16x68" table
No. 4 CINCINNATI Grd. Hd., 16½x64¼" table.
No. 3V VAN NORMAN, New 1942
No. 35 CINCINNATI Grd. Hd., 16½x60" table.
No. 2 CINCINNATI 12¼x52½" table

GRINDERS

14"x48" MATTISON Hyd. Surface
26"x120" LANDIS Cylindrical
No. 3 & No. 2 BROWN & SHARPE Univ., Late Type
12"x36" CINCINNATI Univ., Late Type
No. 10 BLANCHARD Surface
No. 72 & 72-A-3 HEALD Internal
5"x12" TAFT-PIERCE Precision Surface
No. 22 COVEL Tool & Cutter, New 1942
No. 39 EXCELLO Int. Thread, 1940
LATE TYPE No. 26 NORTON "HYPROLAP" Hydr.
6x18" LANDIS TYPE C, Hyd. M.D. Cyl.
No. 13 BROWN & SHARPE Univ. & Tool
84" DIAMOND Face & Edge Grinder

UNIVERSAL & PLAIN MILLS

No. 2 BROWN & SHARPE Univ., New 1942
No. 1-B K & T, UNIVERSAL, M.D.
No. 3 CINCI. Plain, Dial Type, 1942
3B & 1A K & T, Plain Grd. Hd.
No. 2Y BROWN & SHARPE Plain B.G. 34x11" table



SHAPERS

NEW 32", 24", 20", 16" GEMCOS Immediate Delivery from Stock.
LATE 25" SMITH & MILLS B. G. M. D.
24" G & E Gear Box Driven
2—24" CINCI., 1—Univ. Table, 1—Plain Table
24" CINCINNATI HEAVY DUTY, M.D.
20" GOULD & EBERHARDT Box Table
CINCINNATI, Traveling two head
16" G&E Univ. & Tilting Table, M.D.
6½" PRATT & WHITNEY Vertical B.M.D.

RADIAL DRILLS

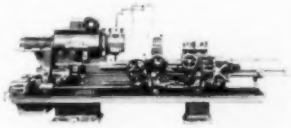
6' AMER., 16" Col., No. 6 M. T.
6' WESTERN, 16" Col., No. 5 M. T.
6' 15" Col. DRESES
5' AMERICAN, 15" Col., D.C. Mtr. on Arm

PRODUCTION MILLS

No. 4-48 CINCI. Hyd. Prod. Mill, 1942
30x120" INGERSOLL PLANER TYPE MILL
42"x42"x13' INGERSOLL SLAB MILL
No. 1836 KEARNEY & TRECKER SIMPLEX
No. 000 BROWN & SHARPE Plain 8x25¾" table, 1942

TURRET LATHES

No. 4 MIDLAND Univ. Ram Type, NEW 1942
4A W & S Univ. Saddle Type, 7¾" hole
3A W & S Univ. Saddle Type, 4⅞" hole
No. 3 W & S Univ., NEW 1941
No. 3 B&O Univ. Bar Feed, NEW 1943
IL GISHOLT Saddle Type, Swing 14"
IL GISHOLT Bar Feed, Preselector Hd., NEW 1942
No. 4F FOSTER "Fastermatic" Automatic Chucker
No. 3R GISHOLT 5¼" hole, 28½" swing



4—MODEL R-14 SENECA FALLS AUTOMATIC "LO-SWING" LATE TYPE LATHES; 11½" swing over slides; 25" centers; Arr. for M.D.

FLOOR LATHES

36"x21' c/c LeBLOND Long Bed, 2 Carr.
36"x29' c/c LeBLOND 36' Bed
24"x72" c/c OLIVER Grd. Hd.
24"x84" c/c SYDNEY Grd. Hd.
NEW 20"/40"x10' SERIES AG NEBEL
18"x30" c/c AMER. Grd. Hd., M.D.
18"x72" c/c AMER. 10½' Bed.

PLANERS

72"x72"x22' CLEVE., Openside, 2 rail heads 1 side head, 60¼"x22'2" table
72"x56"x32' CINCINNATI 4 Heads, box table
48"x48"x10' GRAY Openside, 3 heads, Rapid traverse, AC motor, Box table
42"x42"x18' GRAY 3 heads, Box table, Rapid traverse, M.D.
MODERN 36"x36"x12' LIBERTY Double Housing Box table, AC-DC Generator Dr.

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MACHINE TOOLS

Backed by a 30 day Unconditional Guarantee

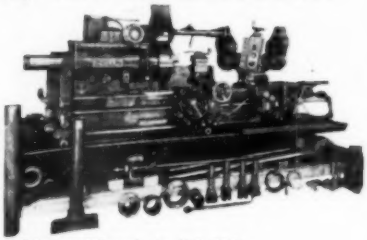
No. 3L GISHOLT SADDLE TYPE TURRET LATHE

Mfd. new 1942 hydraulic speed selector.

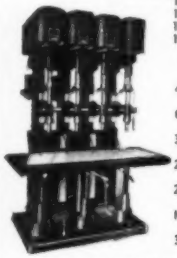
Bar & CK'G equipment.

Replacement cost over $17,800.

No. 61 New Britain Gridley 6-Sp. Auto. Screw Machine with Thrdg. Sp. 1⅜" Cap. Mfd. new 1942



12x30" Model "B" Pratt & Whitney Tool Room Lathe, M.D. 1943
No. 3 W & S Univ. Turret Lathe, M.D. (Bar & Chucking) M.D. 1942
12x30" Monarch Model CK 16-speed with Dbl. Ang. Fwr. Cutoff Slide '43
16x34" LeBlond Heavy Duty Automatic Lathe, M.D. 1941
No. 2 Simmons Micro Speed Turret Lathes, Bar Feed, M.D. 1942
14"x24" Springfield 6-Speed Geared Head Mfg. Lathe, M.D. 1940
14"x6' Springfield Heavy Duty 12-speed Tool Room Lathe, M.D. 1936
14"x9" Springfield 6-Speed Geared Head Mfg. Lathe, M.D. 1935
14"x6' Hendey 8-speed Geared Head, Q.C.G. Lathe, M.D.



4 SP. AVEY 15" DRILL PRESS. No. 2 M.T. AVEYMATIC FEEDS 1945

4 Sp. No. 2 Avey, MA-6 Drill Press '36
6 Sp. Allen 14" (KH) Drill Press '41
3 Sp. No. 2LMS 20" Leland-Gifford '42
2 Sp. No. 1LMS 20" Leland-Gifford '42
2 Sp. No. 18-0 Buffalo Drill No. 3 M.T., NEW.
H-2 Barnes Hydrom Drilling Mch. 2" cap.
30" Upright B.G. Power Feed Drill

10" x 48" CINCINNATI PLAIN HYDRAULIC CYL. GRINDER, 1945

12x36 Cincinnati Univ. Grinder '41
No. 3 Abrasive Auto. Surface Grinder
Oliver Template Tool Bit Grd. '41
6x12" Leach Hd. Surf. Grinder NEW

MISCELLANEOUS

No. 12 B & S Plain Miller 1941
No. 0-8 Cincinnati Pl. Hrz. Mill, '41
Taylor & Fenn Vertical Mills, M.D.
No. 00 B & S H.S. Auto. Screw Mchs. '38
Type 8-M-42 Wells Metal Bd. Saw, '42
W113E Onsrud Router 28" Throat '43

Julius J. Schneir & Co. Inc. MDNA MEMBER

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Jaeger Model 4050-A TOTCO MODEL 942
" " 43-A1 " " 943
" " 43-A3

- Ideally suited for testing the speeds of motors, particularly of fractional horse power, generators, turbines, centrifugals, fans, etc.
- Very small Torque — requires practically no power to drive.
- Unequalled Readability 2" Open face dial—each division on large dial equals 1 RPM; each division on small dial equals 100 RPM. 0 to 1000 r.p.m.
- Greatest Accuracy—meets Navy specifications—guaranteed to be within ½ of 1%.
- Results of test reading remain on dial until next test taken.
- Push button for automatic resetting.

Will give accurately, within a few seconds, by direct reading, the R.P.M. of shafts. Each unit comes complete in a velvet lined carrying case 5"x3½"x1½". Net List Price $70.00—Surplus—Guaranteed. Your cost $17.50 F.O.B. Chicago, Ill.

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3¾" Bar Serial 2867-38

With Turchan Follower

Excellent Mechanical Condition

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LATE MACHINE TOOLS IN METRICS

4—12"x30" geared head Hendey Engine Lathes
2—20"x48" geared head American Engine Lathes
2—22"x96" geared head LeBlond Engine Lathes
4—2K Kearney & Trecker horizontal Millers
4—2 26 Van Norman horizontal Millers

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Carbon	.05 to .12
Manganese	.35 to .55
Sulphur	.06 max
Phosphorus	.08 max
Silicon	.05 max

Available in any length. Widths up to 10". Thicknesses up to 1¼".

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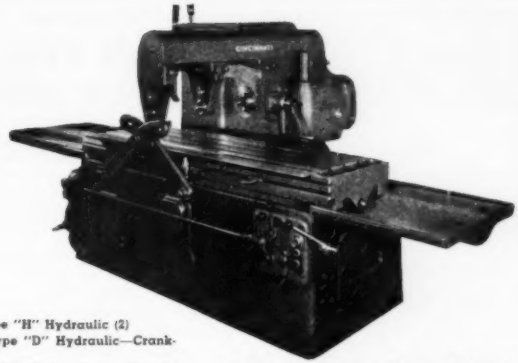
Every Machine is complete and in excellent working condition—ready to be placed in your Production Line



MILLING MACHINES

KEARNEY & TRECKER: #2K Vertical—Sliding Head
KEARNEY & TRECKER: #2H Universal
CINCINNATI: #2M Vertical—Fixed Head
CINCINNATI: #4-48 Hydromatic—Plain
CINCINNATI: #45-48 Hydromatic—Plain
CINCINNATI: #4-36 Hydromatic—Plain
CINCINNATI: #46-96 Hydromatic—2-spindle Vertical Rail Type—Tracer controlled
SUNDSTRAND: #33 Rigidmil "Hydro Screw" with two Vertical Milling Heads
SUNDSTRAND: #96 Rigidmil "Duplex" (arranged for milling cam of Propeller Hubs, or similar work)
BRIDGEPORT: Vertical Milling Machine (2)
TAYLOR-FENN: #M-80 Spline Miller
RICE BARTON: Model K Spline Miller (2)

THREAD MILLERS AND TAPPERS

HANSON WHITNEY: 8"x16" Thread Miller
MOREY: 12"x60" Thread Miller
LEES BRADNER: #40A Thread Miller
HALL PLANETARY: Type "C" Thread Miller
KAUFMAN: #5A Tappers (2) equipped with 2-spindle Tapping Heads
MURCHEY: #22 Tapping Machine—Horizontal

THREAD GRINDERS

EXCELLO: #31 External (4)
EXCELLO: #33 External
JONES & LAMSON: TG-636 External Universal (2)
JONES & LAMSON: TG-1245 External Universal
JONES & LAMSON: TG-125 Internal

GRINDERS—Cylindrical

LANDIS: 18"x18" Type "C" Hydraulic (3)
LANDIS: 6"x18" Type "C" Hydraulic
LANDIS: 4"x12" Type "H" Hydraulic (2)
LANDIS: 18"x32" Type "D" Hydraulic—Crankpin
CINCINNATI: 6" x 18" Hydraulic — Filmatic Bearings (3)
BROWN & SHARPE: #5 Plain

GRINDERS—Surface

THOMPSON: 8"x12"x24" Hydraulic
THOMPSON: 12"x10"x24" Hydraulic
THOMPSON: 12"x12"x40" Hydraulic
BROWN & SHARPE: #2B Hand Feed

LAPPING MACHINES

NORTON: #26 Hyprolap (4)
NORTON: 2Fx36" Hand Lapping Machine (2)
CINCINNATI: #2 Centerless Lapping Machine

GRINDERS—Internal

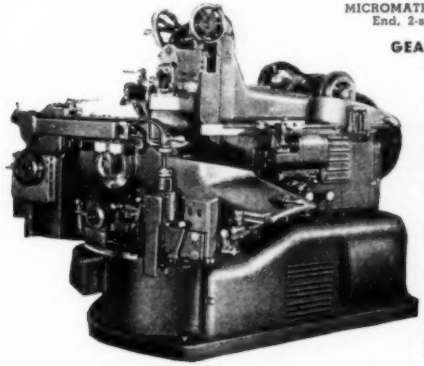
HEALD: #72-A5 Plain with either fixed or cross sliding Work Head (6)
HEALD: #72-A3 Plain with cross sliding Work Head (2)
HEALD: #70-A Plain
HEALD: #72-A5 Size-Matic
HEALD: #172—Size-Matic—Gap Bed
BRYANT: #16-28 Hole Grinder (4)
BRYANT: #24-36 Hole Grinder (2)
BRYANT: #112 Hydraulic Universal (2), one machine equipped with high frequency wheel head
BRYANT: #5 Heavy Duty
RIVETT: #104 Tool Room Grinder

GRINDERS—Radius

VAN-NORMAN: #639 Oscillating—External (2)
VAN-NORMAN: #73 Oscillating—Internal (2)
VAN-NORMAN: #39 Oscillating—External

HONING MACHINES

MICROMATIC: #200 Hydrohoner—Double End
MICROMATIC: Mod. H-2 Hydrohoner—Single End, 2-spindle.



GEAR & SPLINE GRINDERS

PRATT & WHITNEY: 10" Single Wheel—Hydraulic, for Spur & Helical Gears (10)
PRATT & WHITNEY: 10" Two Wheel—Hydraulic, for Spur & Helical Gears (2)
PRATT & WHITNEY: 18" Single Wheel—Hydraulic, for Spur & Helical Gears
GEAR GRINDING MACHINE CO.: Mod. GG-33 18"x42" Hydraulic, for Spur Gears & Splines
GEAR GRINDING MACHINE CO.: Mod. GG-19 10"x24" Hydraulic, for Spur Gears & Splines (3)
GLEASON #17 Hypoid—for precision grinding Spiral Bevel, and Hypoid Gears (2)

GEAR CUTTING MACHINES

FELLOWS: #61 Gear Shaper
FELLOWS: #72 Gear Shaper High Speed
FELLOWS: Mod. "Z" Gear Shaper—Horizontal
BARBER-COLMAN: #3 Gear Hobber
GLEASON: 3" Bevel Gear Generator (2)
CLEVELAND: #145 Rigidhobber

GEAR FINISHING & TESTING MACHINES

FELLOWS: #6LSI & #13LSI Gear Lappers (8)—for Internal & External, Spur & Helical Gears.
FELLOWS: #12 Gear Shaver with Crowning Attachment
GLEASON: #4 and #6 Gear Testers—hand and power operated (10)
GLEASON: #13 Gear Tester—Universal
ILLINOIS: #224 Involute Profile Checkers (2) one with Electric Recorder
NATIONAL BROACH: Mod. SIC-12" Red Ring Gear Tester
MICHIGAN TOOL: #1124 Involute Profile Checker with Electric Recorder

PRECISION BORING MACHINE

EXCELLO: #2112-A Single End (3)

PRODUCTION LATHES

GISHOLT: #4F Fastermatic Turret Lathe with large assortment of tooling
GISHOLT: #2F Fastermatic Turret Lathe
LODGE & SHIPLEY: #3Ax15" Duomatic Lathe
LIPE-ROLLWAY: 15"x30" Carbomatic Hydraulic, fully Automatic Multi-Tool Lathes (2)
SUNDSTRAND: #8 Automatic Lathes (2) 15" and 21" centers
MICHIGAN TOOL: #1708 Universal Relieving Lathe 10"x24"
LE BLOND: 25"x50" Heavy Duty Engine Lathe raised to swing 40"
WARNER & SWASEY: #3A Turret Lathe (older model)—bar feed

MISCELLANEOUS

LAPOINTE: 72" Universal Broach Sharpener
CAMPBELL: #425 Cutalator—Cut off machine
BAKER: #30 HO—Inverted 2-spindle Drill (new)
FOSDICK: #2 High Speed Upright Drill
PRATT & WHITNEY: ½"x50" Model B Deephole Driller
RANSOME: #30 Weld Positioners (2)—Power operated
MATHEWS: #79A Marking Machine
OLIVER: Tool Bit Grinder, Template Type
OLIVER: #2A Face Mill Sharpener
TANNEWITZ: Mod. G-1 36" Band Saws (5) High Speed
DENISON: Mod. A-918-AM Hydraulic Test Stand
PROVIDENCE ENG.: 6-spindle Sensitive Drill, Vertical 3/16" Drill Capacity
GENERAL ENGINEERING: Mod. GBR Riveter —36" Throat
KENT: Bar Pointing Machine—3¼" Cap.

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ARTER #A3—12" Rotary, M.D.—Power—elevation to table
BLANCHARD #11—20" Vert. Spindle Rotary, M.D.
COVEL #20 (6"x18") Hyd.—M.D.—chuck
GALLMEYER & LIVINGSTON #38 (8x36) M.D. —Hydr.—vert attach.
REID #2B (6"x18") Auto. Feed—M.D.—chuck
ROBOT 6x18 Auto. Feed—M.D. in base

CYLINDRICAL & INTERNAL GRINDERS

B&S #1 (10"x20") Univ.—M.D.
B&S #10 Plain Tool & Cutter—M.D.
CINCINNATI #2 Centerless Filmatic Spindle—M.D.
CINCINNATI #2 Univ. Tool & Cutter—M.D.
GRENBY—Model 1G—12" Internal—M.D.
*LANDIS 10"x24"—Hyd. Universal—M.D.
NORTON 6"x18" Type C—Plain—Cyl.—M.D.
NORTON 6"x18" Type C—Semi-Auto.—Plain
NORTON 10x24 Spec. Cam
NORTON 12x36 Type C—Multi-Purpose—Univ.—M.D.

LATHES

*AMERICAN 14"x6'—Geared Head—QCG—M.D.
LeBLOND 13"—Rapid Production—M.D.
*HENDEY 14"x8' Geared Head—QCG—M.D.
*HENDEY 14"x7' Geared Head—QCG—M.D.—T.A.
LODGE & SHIPLEY 14"x30"—12 speed—geared head—QCG
*FAY & SCOTT 20/40x8 Gap—M.D.
MONARCH 19"x30" Model CW—16 sp.—geared head
SEBASTIAN 16"x8'—8 sp.—geared head—M.D. (NEW)
SOUTH BEND 14½"x6' QCG—Motor in Base—T.A. (2)
SOUTH BEND 16"x12' QCG—Motor in Base—T.A.

AMERICAN 16"x102" Pacemaker Geared Head—QCG—M.D.—Taper Attach.—Chucks

TURRET LATHES

2—B&S #2 Wire Feed Screw—(1) Power Feed to Turret
GISHOLT #4 Univ.—Bar Feed
GISHOLT #5 Univ.—pre-set. head—air chuck
W&S #3 Univ.—Air Chuck
W&S #4 Univ.—Pre-set. head—bar feed

PLAIN & UNIVERSAL MILLING MACHINES

VAN NORMAN #12 Ram Type Duplex Miller M.D.—Div. Heads—High Speed Head—1946 Mfg.

BRISTOL #1 Hand—M.D.
*B&S #2A Univ.—Div. Hds.—Vert. Attach.—M.D.
CINCINNATI #2 Dial Type—Plain—Horiz.—M.D.
K&T (Milw.) #2HL—Plain—M.D.
K&T (Milw.) #2K—Plain—M.D.
K&T (Milw.) #3H Plain—M.D.
NICHOLS—Hand—M.D. (2)
VAN NORMAN #2S—Plain
*VAN NORMAN #20 Ram Type—Duplex—M.D.

VERTICAL MILLING MACHINES

CINCINNATI #2 Dial Type—Hi Speed—Vertical—power to head
FRAY #7B Ram Type—Univ.—(Bridgeport Type)
K&T (Milw.) #2K Vertical—power to head
K&T (Milw.) #3H Vertical—Power to head

PRODUCTION MILLING MACHINES

B&S #12 Elec Controlled—18" feed (2)
B&S #000 Plain
CINCINNATI #1-12 Knee Type—M.D.
LEES-BRADNER #40 Thread—M.D.

SUNDSTRAND #0-12 Rigidmill
U. S. MM-1-16 Multi—M.D.

PLANERS

*PUTNAM 24"x24"x8'—c.s. drive
*WOODWARD 30"x30"x12' Double Housing—belt drive—2 rail heads 2 side heads

PRESSES

*BLISS #4 Styles Type—45 ton (4)
*BLISS #22—45 ton—O.B.I.
*NOZEL—45 ton—double action—O.B.I.
*MANVILLE—15 ton—cutback frame

PERKINS #350B—20 ton—O.B.I. Press—M.D. —NEW
PERKINS #550B—45 ton—O.B.I. Press—M.D. —NEW

MISCELLANEOUS

2—PRATT & WHITNEY #12B—2 spindle Profilers—M.D.

*B&S #0G Automatic—M.D. in base—vert. slide Screw Machine
*CURTIS Centrifugal—M.D. Oil Extractor
FOSTER Superfinisher
GROB—Model NS-18 Metal Band Saw
*HOLMES #20½ Hoop Flaring Machine
*PRATT & WHITNEY #13 Profiler
*RUESON 72" Spur Gear Cutter

ROCHESTER 3" Bar Horiz. Boring Mill M.D. Priced Right

2—CANEDY-OTTO 21" Box Col. Upright Drills—M.D.—coolant

UNITED MACHINERY & TOOL CORPORATION

88 CENTRAL STREET — **WORCESTER, MASS.**

BETTER GRADE MACHINES

Comparator, #20 Doall. (1945)
Drill, #25—36" Foote-Burt. (1942)
Drill, 5-spdl. Allen, type 2-KH, 5 motors 3, 60
Grinder, #2 Cincinnati Tool & Cutter
Grinder, #2 Brown & Sharpe, Surface
Grinder, #2 Cincinnati Centerless. (1942)
Grinder, #3 Cincinnati Centerless. (1944)
Hack Saw, 15"x15" Racine, AC. Motor
Lathe, 10"x4' South Bend Toolroom
Lathes, 14"x8' & 18"x8' Monarch
Miller, #12 Brown & Sharpe Mfg. type. (1942)
Press, Arbor, #7 Greenard, ratchet, hand
Press, Zeh & Hahnemann, SS., 80-tons
Wire Forming Mach., 4-Slide, Nilson S-4

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GALBREATH MACHINERY CO.
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VERTICAL BORING MILLS

61" Bullard Maxi-Mill; M.D.
42" Bullard New Era Vert. Turret Lathe

LATHES

72"x30' Putnam; with raising blocks to swing 92"; M.D.
36"x30' American; M.D.
36"x20' Putnam; M.D.
20"x8' Springfield; M.D.
14"x6' Hendey; M.D.
12"6' Hendey; M.D.
12"x5' Lodge & Shipley; M.D.

MILLING MACHINES

Nos. 4 & 3 Cincinnati Vertical; M.D.
No. 3 Kearney & Trecker Vertical; M.D.
Nos. 5, 3 & 2 Cincinnati Rectangular Plain
No. 4 Cincinnati Plain; M.D.
No. 3B Kearney & Trecker Plain; M.D.
18" Cincinnati Automatic; M.D.

SCREW MACHINES

#61 New Britain Gridley 2¼" 6-spindle; M.D.
9-16" National Acme Model "C" 5-spindle; M.D.

MISCELLANEOUS

14" Pratt & Whitney Vertical Surface Grinder; Model "B" Ball Bearing; M.D.
10" Pratt & Whitney Vertical Shaper

SUN MACHINERY CO.
36 Van Vechten St., Newark 5, N. J.

IMMEDIATE DELIVERY

New #0 and #1½ Buffalo Ironworkers M.D.
New 816 and 818 Chicago Brakes
Nos. 3, 4, 5 Warner & Swasey M.D., late
12"x24" Cincinnati Universal Grinder, 1943
72A5 Heald Internal, 1943
#7125 Fellows Gear Shaper, 1941
#12 Van Norman Univ. Miller, 1943
#0 Sundstrand Stub Lathe, 1943
20x48 Springfield Lathe, 1943
12x30 Monarch Lathe, 1943
4x12 Landis 4H Grinder, 1943
36H Gould & Eberhardt Gear Hobber
48" Gleason Bevel Gear Planer
24" Bullard "New Era" 14,000 Serial
54" Gisholt Vertical Turret Lathe
3K Kearney & Trecker Vertical, 1943
#2 & #3 Kearney & Trecker Plain M. in base
20x25 Fay Automatic, 1943
16H Gorton Automatic Screw Mach., 1943
10x10 Peerless Shaping Saw, Hydraulic, 1943

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Bullard 18" Boring Mill, Serial #6156
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36" Exhaust Fans, 3 HP, 3", TEFC Motors
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IN STOCK AT ALL TIMES

Pumps, Motors, Blowers, Speed Reducers, Machine Tools and Power Transmission Equip.

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Armory 4-4959-4971

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200 KVA GUN SPOT WELDERS

Progressive Welder Co 440 volt 60 cy. Scissors Pinch type, with Hydro booster and West. Weldotrol control. Price ea. $1500.00.

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Irvington 2336

PLASTIC DIPPING COMPOUND

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HORIZONTAL BORING MILLS

#45 Giddings & Lewis Table Type
3½" Cincinnati Gilbert Floor Type
#40—4" Landis Floor Type
5" Ohio Floor Type
6" Simmons

VERTICAL BORING MILLS

24" and 36" Bullard Spiral Drive

BOREMATICS

#49 Heald Double End
#49 Heald Universal Single End
#48A Heald Single End
#DB102 Excello Double End
#DB216 Excello Double End

RADIAL DRILLS

4' Cincinnati-Bickford 9" column
5' American Triple Purpose

GEAR MACHINERY

12" Gleason Straight Bevel Gear Generator
#13 Gleason Universal Gear Tester
15" Gleason Bevel Cutter Sharpener

INTERNAL GRINDERS

#3 Bryant Internal Chucking
#16-16" Bryant Hydraulic Internal
#70A Heald Internal
#72A3 Heald Plain Internal

PLAIN CYLINDRICAL GRINDERS

6" x 18" Cincinnati Model EA Hydraulic
6" x 18" Norton Model C Hydraulic
10" x 18" Norton Model C Hydraulic
#30A Brown & Sharpe

SURFACE GRINDERS

8" #20 Heald Rotary
12" Model A3 Arter Rotary
#33 Abrasive Vertical Spindle type
Sickle Schonherr Surface & Way

UNIVERSAL CYLINDRICAL GRINDER

#2 Brown & Sharpe

TOOL & CUTTER GRINDERS

#13 Brown & Sharpe Universal & Tool
#7 Grand Rapids Hydraulic Universal & Tool

MISCELLANEOUS GRINDERS

#2 Cincinnati Centerless
#TG125 Jones & Lamson Internal Thread
#TG615 Jones & Lamson Auto. Thread
#95-85 Bridgeport Face

NUT & BOLT EQUIPMENT

#250C Manville SSSD Bolt Header
#250C Manville SSSD Header
#2B Manville SSSD Header
#500C Manville Hand Feed Thread Roller
#2 Waterbury Farrel Auto Nut Tapper

LATHES

14" x 54" Hendey Geared Head
16" x 30" Sidney Geared Head
20" x 48" LeBlond Geared Head
25" x 120" LeBlond Geared Head
27" x 48" LeBlond Geared Head
42" x 86" American Geared Head
42" x 108" Niles Geared Head

MILLING MACHINES

#3SU Van Norman Universal
#2SP and #3SP Van Norman Plain
#26 Van Norman Ram type Plain
#3 Cincinnati Dial type Plain
#5H and #5HM Kearney & Trecker Plain
#2 Cincinnati Dial type Vertical
#2 Standard Brown & Sharpe Vertical
#3V Van Norman Vertical
#3 Cincinnati Dial type Vertical
#4 Reed Prentice Vertical Miller and Die Sinker
#2-18 Cincinnati Plain Auto.
#4-36" and #5-48" Cincinnati Plain Hydromatic
#1854 Kearney & Trecker Simplex
4½" x 12" Pratt & Whitney Model C Thread
#10CT Van Norman Dual Head Contour

TURRET LATHES

#1, #2, #3, #4 Warner & Swasey
#5U Foster Geared Head
#1L Gisholt Geared Head
#7A Jones & Lamson Geared Head
#1A and #3A Warner & Swasey

MISCELLANEOUS MACHINERY

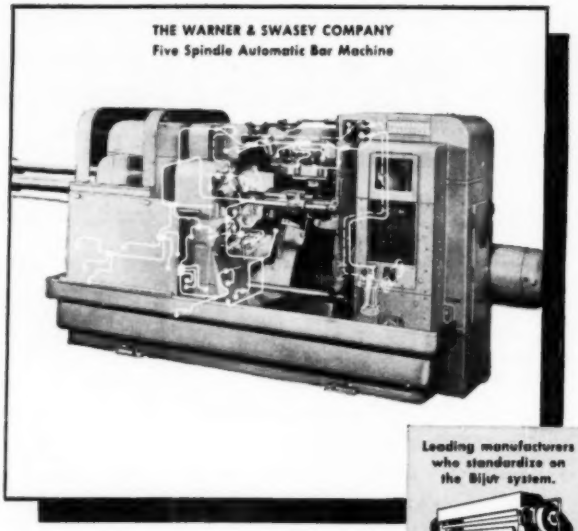
36" Hendey Shaper
100" Morgan Gap Type Power Squaring Shear
#12 Bertsch Seven Roll Plate Straightening Roll

J. L. LUCAS & SON, Inc.

P. O. BOX 3006 — BRIDGEPORT 5, CONNECTICUT

Your machines run smoother, longer...

THE WARNER & SWASEY COMPANY
Five Spindle Automatic Bar Machine



...on bearings oiled by an automatic system of "metered" lubrication

Your machines run smoother, longer and continuously on Bijur-oiled bearings.

Smoother because the correct oil film is constantly maintained by meter-units at the bearings. *Longer* because overall bearing wear is considerably reduced by positive control of oil flow. *Continuously* because a Bijur-equipped machine oils itself while running, eliminating down-time for lubrication.

These factors enable the user to boost production output, cut maintenance costs, and also lengthen the effective life of the machine.

Increased Production Output. A Bijur-lubricated machine oils itself while running, doing away with wasteful down-time for lubrication. Daily maintenance time is thus converted into more time for production.

Decreased Maintenance Costs. A Bijur-lubricated machine assures positive control of oil flow, considerably reducing bearing wear. Longer effective bearing life results in less down-time for repairs and maintenance.

If lubrication is your problem, why not call on the Bijur engineer, or write for "The Travels of Modern Lubrication." This quarterly bulletin shows how leading manufacturers protect performance and maintain production by using Bijur-lubricated machines.

BIJUR

LUBRICATING CORPORATION

LONG ISLAND CITY 1 NEW YORK

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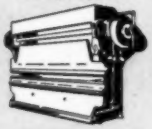
Leading manufacturers who standardize on the Bijur system.



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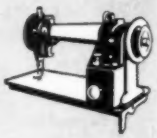
Verson "Press Brake"

PACKAGING MACHINERY
Pneumatic Scale "Rotary Top Closing Machine"

FOOD MACHINERY
Baker Perkins "Dough Divider"

PRINTING PRESS
ATF "Chief Offset Press"



TEXTILE MACHINERY
Willcox & Gibbs "Lockstitch Machine"

Like these manufacturers, you too can "be sure with Bijur."

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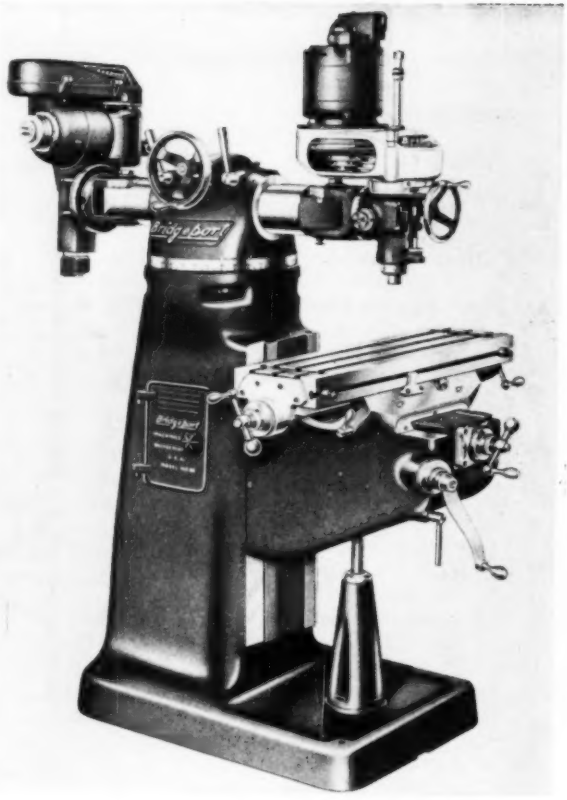
TURRET MILLING MACHINES

make many previous methods obsolete

YOU can't hope to get costs down if you continue to mess around with old equipment. There are so many ways through which "Bridgeports" cut costs, that their use definitely outmodes and outperforms a lot of tool room and production methods heretofore considered efficient and satisfactory.

For example, with the "Bridgeport" it is no longer necessary to change set up for each successive machining operation involved on the same piece. Work can be placed on the "Bridgeport" and milled, drilled, bored or shaped at all angles without changing set up. The time saved and the accuracy assured is obvious from even a casual study of the possibilities of these modern machines. It will pay you to investigate.



● SPECIFICATIONS

Longitudinal Feed . . . 20" with standard 32" table. Cross Feed . . . 9". Vertical Feed of Knee . . . 16". Tables 36", 42" and 48" are available; also longitudinal power feed. Weight with Shaping Unit . . . 2,000#.

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Bridgeport, Connecticut

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THE NEW BRITAIN MACHINE COMPANY
New Britain, Connecticut
Manufacturers of multiple spindle automatic screw machines, chucking machines and precision boring machines
Announces the acquisition of
LUCAS MACHINE TOOL COMPANY
Cleveland, Ohio
Manufacturers of horizontal boring, drilling and milling machines.
This logical step joins two names, famous for more than fifty years for machine tools built to the highest standards of accuracy and productivity.
The Lucas Machine, Division of the New Britain Machine Company will continue its Cleveland operations under the capable direction of its present management.
LUCAS OF CLEVELAND

Crankshaft Turn Mill gets greater precision with TIMKEN® bearings on cutter spindles

GISHOLT MACHINE COMPANY

assures high speed production—maintains accuracy by mounting spindles and headstocks of this Crankshaft Turn Mill on Timken tapered roller bearings.

FOUR throws of a typical V-8 crankshaft machined simultaneously in only 2 minutes—floor-to-floor time! That's the performance automobile manufacturers can expect with this Gisholt Crankshaft Turn Mill.

To help maintain precision with high production on long runs, Gisholt equips all four cutter spindles as well as the two rotating headstocks with Timken® tapered roller bearings.

Timken bearings hold spindles and headstocks rigid, yet free to rotate easily. The tapered construction of Timken bearings carries both radial and thrust loads and permits accurate pre-loading. End-movement is eliminated and precision maintained indefinitely.

The line contact between the rolls and races gives Timken bearings maximum load-carrying capacity. True rolling motion results in friction-free rotation with negligible wear. And Timken bearings normally last as long as the machine itself.

No other bearing can bring you all the advantages you get with Timken tapered roller bearings. Be sure you have them in the machine tools you build or buy. Look for the trade-mark "Timken" on the bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

GENERATED UNIT ASSEMBLY

An extra step in the manufacture of Timken bearings—after assembly—results in a natural and true geometric contact being generated between all rotating parts.

This perfect mating of the component parts—cone, rolls and cup—assures positive roll alignment, long lasting precision, permanent adjustment and smooth operation.

TIMKEN®
TAPERED
ROLLER BEARINGS

NOT JUST A BALL — NOT JUST A ROLLER — THE TIMKEN TAPERED ROLLER — BEARING TAKES RADIAL AND THRUST — LOADS OR ANY COMBINATION